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UNITED STATES PATENT AND TRADEMARK OFFICE

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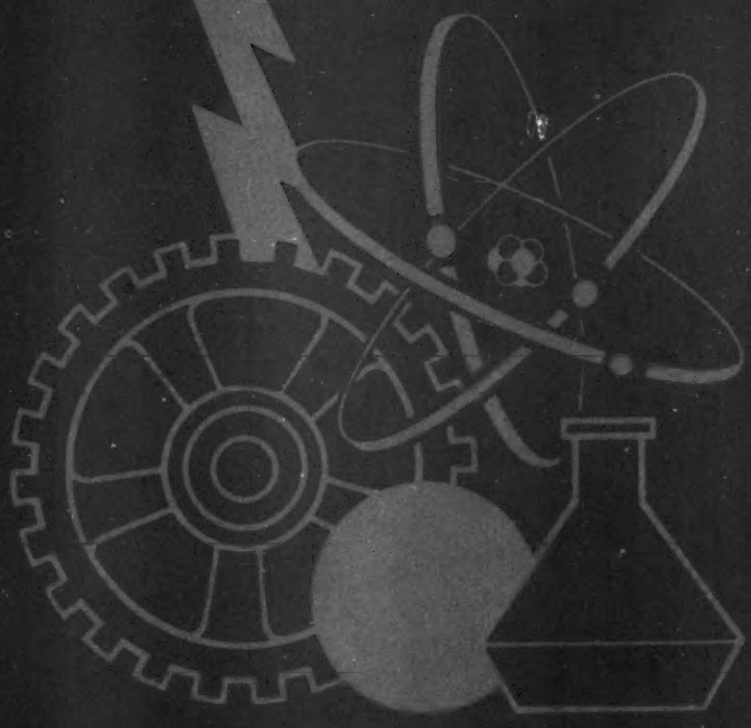

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

June 6, 1978 Volume 971 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Items Published in the Official Journal of the European Patent Office

The European Patent Office has requested that the following notices be published in the OFFICIAL GAZETTE since they are of interest to persons involved in the field of patent law in the United States. The notices relate to three topics:

1. The announcement concerning the filing and restrictions on the processing of European patent applications. In this notice, the Patent and Trademark Office has added the title of the areas of the International Patent Classification referred to.
2. The decision of the Administrative Council of the European Patent Organization concerning the restriction of the processing of European patent applications.
3. The announcement concerning the information service regarding the restriction of processing of applications—Preclassification Service and the Request form for the Preclassification Service.

The notices read as follows:

ANNOUNCEMENT CONCERNING THE FILING AND RESTRICTIONS ON THE PROCESSING OF EUROPEAN PATENT APPLICATION*

1. *Filing of European patent applications*

On the recommendation of the President of the European Patent Office, the Administrative Council of the European Patent Organisation decided at its first meeting (19–21 October 1977), pursuant to Article 162, paragraph 1, of the European Patent Convention (EPC), that European patent applications may be filed with the EPO from 1 June 1978.

Pursuant to this decision the EPO will be accepting European patent applications from 1 May 1978. However, the date of filing of applications received in May will be 1 June 1978. Applications may be filed with

(a) the branch of the European Patent Office at The Hague (Patentlaan 2, NL–2280 Rijswik) or
(b) the European Patent Office in Munich (Rosenheimer Str. 30, Motorama Haus, D–8000 München 80).

Wherever possible, applications should be filed with the branch at The Hague since it will be handling the first phase of the procedure.

The right to file European patent applications with the central industrial property office or other competent authority of a Contracting State, where the law of that State so permits, is not affected (see Article 75, paragraph 1 (b) EPC).

DECISION OF THE ADMINISTRATIVE COUNCIL OF THE EUROPEAN PATENT ORGANISATION OF 19 DECEMBER 1977 CONCERNING THE RESTRICTION OF THE PROCESSING OF EUROPEAN PATENT APPLICATIONS UNDER ARTICLE 162, PARAGRAPH 2, OF THE EUROPEAN PATENT CONVENTION*

The Administrative Council of the European Patent Organisation,

Having Regard to the European Patent Convention, and in particular Article 162, paragraph 2 thereof,

Having Regard to the proposal of the President of the European Patent Office,

Having Regard to the written procedure initiated pursuant to Article 7 of the Rules of Procedure of the Administrative Council on the basis of the letter dated 17 November 1977 to Council members and of document CA/2/77 annexed to that letter.

Has Decided as Follows:

ARTICLE 1

As from 1 June 1978 the processing of European patent applications in certain areas of technology shall be restricted.

ARTICLE 2

The restrictions shall apply solely in respect of substantive examination and subsequent proceedings.

ARTICLE 3

The areas of technology in which applications filed in the period from 1 June 1978 to 30 November 1978 will be fully processed shall be as listed in column 1 of the Annex to this Decision.

ARTICLE 4

The areas of technology in which applications filed in the period from 1 December 1978 to 31 May 1979 will be fully processed shall be as listed in column 2 of the Annex to this Decision.

ARTICLE 5

This decision shall enter into force on 19 December 1977.

DONE at Berne, 19 December 1977.

For the Administrative Council

The Vice-Chairman

Paul Braendli

Annex

AREAS OF TECHNOLOGY IN WHICH APPLICATIONS WILL BE FULLY PROCESSED

The areas of technology listed below are defined by the symbols of the International Patent Classification.

*This Decision of the Administrative Council of the European Patent Organisation confirms the announcement published in the Official Journal No. 1/1978 (page 31) concerning the filing and restrictions on the processing of European patent applications. The fields of technology listed in that announcement and annexed to this decision are identical.

The classification symbols to be taken into consideration in determining the technical field will be restricted to those classifying the invention.

If an invention is classified with more than one classification symbol and not all of these symbols are included in the areas of technology mentioned in the Annex to the decision of the Administrative Council then the application having as its subject this invention will be processed without restriction.

Column 1		Column 2	
		A 22	BUTCHERING; MEAT TREATMENT; PROCESSING POULTRY OR FISH
A 47	FURNITURE; DOMESTIC ARTICLES OR APPLIANCES; COFFEE MILLS; SPICE MILLS; SUCTION CLEANERS IN GENERAL	A 47	FURNITURE; DOMESTIC ARTICLES OR APPLIANCES; COFFEE MILLS; SPICE MILLS; SUCTION CLEANERS IN GENERAL
A 61	MEDICAL AND VETERINARY SCIENCE; HYGIENE	A 61	MEDICAL AND VETERINARY SCIENCE; HYGIENE
		A 62	LIFE-SAVING; FIRE-FIGHTING (Excluding A 62 D) Chemical means for extinguishing fires or for combating or protecting against harmful chemical agents; Chemical materials for use in breathing apparatus
B 21	MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL	B 21	MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL: PUNCHING METAL
B 23	MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR	B 23	MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR
B 24	GRINDING; POLISHING	B 24	GRINDING; POLISHING
		B 25	HAND TOOLS; PORTABLE POWER-DRIVEN TOOLS; MANIPULATORS
		B 26	HAND CUTTING TOOLS; CUTTING MACHINES OR DEVICES NOT SPECIALLY ADAPTED FOR PARTICULAR MATERIALS OR PURPOSES
		B 27	WORKING OR PRESERVING WOOD OR SIMILAR MATERIAL; NAILING OR STAPLING MACHINES IN GENERAL (Excluding B 27 K) Processes, apparatus or selection of substances for impregnating, staining, dyeing, bleaching of wood or similar materials, or treating of wood or similar materials with permeant liquids, not otherwise provided for; Chemical or physical treatment of cork, cane, reed, straw or similar material
		B 28	WORKING CEMENT, CLAY AND STONE
B 29	WORKING OF PLASTICS; WORKING OF SUBSTANCES IN A PLASTIC STATE, IN GENERAL; WORKING OF SUBSTANCES NOT OTHERWISE PROVIDED FOR	B 29	WORKING OF PLASTICS; WORKING OF SUBSTANCES IN A PLASTIC STATE, IN GENERAL; WORKING OF SUBSTANCES NOT OTHERWISE PROVIDED FOR
B 30	PRESSES	B 30	PRESSES
B 60	VEHICLES IN GENERAL	B 60	VEHICLES IN GENERAL
		B 61	RAILWAYS
B 62	LAND VEHICLES FOR TRAVELLING OTHERWISE THAN ON RAILS	B 62	LAND VEHICLES FOR TRAVELLING OTHERWISE THAN ON RAILS
B 65	CONVEYING; PACKING; STORING; HANDLING THIN OR FILAMENTARY MATERIAL	B 65	CONVEYING; PACKING; STORING; HANDLING THIN OR FILAMENTARY MATERIAL

C 01	INORGANIC CHEMISTRY
C 02	TREATING WATER, WASTE WATER AND SEWAGE
C 03	GLASS; MINERAL AND SLAG WOOL
C 04	CEMENTS; CERAMICS, etc.; SOUND OR THERMAL INSULATING MATERIALS
C 05	MANUFACTURE OF FERTILISERS
C 06	EXPLOSIVES; MATCHES
C 07	ORGANIC CHEMISTRY
C 08	ORGANIC MACROMOLECULAR COMPOUNDS; THEIR PREPARATION OR CHEMICAL WORKING-UP; COMPOSITIONS BASED THEREON
E 04	BUILDING
E 05	LOCKS; KEYS; WINDOW AND DOOR FITTINGS; SAFES
E 06	DOORS, WINDOWS, SHUTTERS OR ROLLER BLINDS, IN GENERAL; LADDERS
F 16	ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS
F 24	HEATING; RANGES; VENTILATING
F 25	REFRIGERATION OR COOLING; MANUFACTURE OR STORAGE OF ICE; LIQUEFACTION OR SOLIDIFICATION OF GASES
F 26	DRYING
F 28	HEAT EXCHANGE IN GENERAL

C 01	INORGANIC CHEMISTRY
C 02	TREATING WATER, WASTE WATER AND SEWAGE
C 03	GLASS; MINERAL AND SLAG WOOL
C 04	CEMENTS; CERAMICS, etc.; SOUND OR THERMAL INSULATING MATERIALS
C 05	MANUFACTURE OF FERTILISERS
C 06	EXPLOSIVES; MATCHES
C 07	ORGANIC CHEMISTRY
C 08	ORGANIC MACROMOLECULAR COMPOUNDS; THEIR PREPARATION OR CHEMICAL WORKING-UP; COMPOSITIONS BASED THEREON
C 21	METALLURGY OF IRON
C 22	METALLURGY; FERROUS OR NON-FERROUS ALLOYS; TREATMENT OF ALLOYS OR NON-FERROUS METALS
C 23	WORKING OR TREATMENT OF METALS, OTHER THAN BY MECHANICAL MEANS; COVERING MATERIALS WITH METALS; INHIBITING CORROSION OR INCRUSTATION IN GENERAL
C 25	ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR
E 04	BUILDING
E 05	LOCKS; KEYS; WINDOW AND DOOR FITTINGS; SAFES
E 06	DOORS, WINDOWS, SHUTTERS OR ROLLER BLINDS, IN GENERAL; LADDERS
E 21	MINING
F 16	ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS
F 22	STEAM GENERATION
F 23	COMBUSTION APPARATUS; COMBUSTION PROCESSES
F 24	HEATING; RANGES; VENTILATING
F 25	REFRIGERATION OR COOLING; MANUFACTURE OR STORAGE OF ICE; LIQUEFACTION OR SOLIDIFICATION OF GASES
F 26	DRYING
F 28	HEAT EXCHANGE IN GENERAL

G 02 OPTICS

G 03 PHOTOGRAPHY; CINEMATOGRAPHY; ELECTROGRAPHY; HOLOGRAPHY

(Excluding G 03 C)

Photosensitive compositions or bases carrying them; Photographic processes, e.g. cine, X-ray, colour, stereo-photographic processes; Auxiliary processes in photography

G 05 CONTROLLING; REGULATING

G 07 CHECKING DEVICES

G 09 EDUCATION; CRYPTOGRAPHY; ADVERTISING; SEALS

H 01 BASIC ELECTRIC ELEMENTS

H 01 B Cables; Conductors; Insulators; Selection of materials for their conductive, insulating or dielectric properties

C Resistors

G Capacitors; Capacitors, rectifiers, detectors, switching devices or light-sensitive devices, of the electrolytic type

H Electric switches; Relays; Emergency protective devices

J Electric discharge tubes or discharge lamps

K Electric incandescent lamps

L Semiconductor devices; Electric solid state devices not otherwise provided for

P Waveguides; Resonators, lines, or other devices of the waveguide type

Q Aerials

R Line connectors; Current collectors

S Devices using stimulated emission

T Spark gaps; Other non-enclosed discharge apparatus

H 02 GENERATION, CONVERSION OR DISTRIBUTION OF ELECTRIC POWER

H 02 B Switchboards, switchyards, or switchgear, for the distribution of electric power

G Installation of electric cables or lines

G 02 OPTICS

G 03 PHOTOGRAPHY; CINEMATOGRAPHY; ELECTROGRAPHY; HOLOGRAPHY

(Excluding G 03 C)

Photosensitive compositions or bases carrying them; Photographic processes, e.g. cine, X-ray, colour, stereo-photographic processes; Auxiliary processes in photography

G 05 CONTROLLING; REGULATING

G 07 CHECKING DEVICES

G 08 SIGNALLING

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G Installation of electric cables or lines

H 04 ELECTRIC COMMUNICATION TECHNIQUE

ANNOUNCEMENT—INFORMATION SERVICE REGARDING THE RESTRICTION OF PROCESSING OF APPLICATIONS (PRE-CLASSIFICATION SERVICE)

As long as the processing of European patent applications is restricted under Article 162, paragraph 2, the European Patent Office (EPO) will offer the following service to potential applicants:

The European Patent Office will determine provisionally in which sub-class or sub-classes of the International Patent Classification an invention which is likely to form the subject of a European patent application falls.

The EPO will also establish whether this sub-class or these sub-classes will be the areas of technology in respect of which processing is restricted at the envisaged time of filing of the prospective application.

The EPO will then communicate this information to the person making the request.

The EPO will perform this service in response to a written request. When making their request, users of the service are recommended to use the form in the Annex, which will be obtainable from the EPO (see addresses below), or to use the text of the form in their request.

If the form or text thereof is not used, the request should in any case be clearly identified as a request for the "pre-classification service." It should state that an indication is required of the sub-class or sub-classes of the International Patent Classification in which the invention falls, and whether this sub-class or one of these sub-classes will be on the list open for examination at the envisaged time of filing. The request should state in which month the prospective application is likely to be filed. The request and the documents accompanying it must be in an official language of the EPO, (English, French or German).

The pre-classification request must be accompanied by the following documents: either

a) the description, claims and drawings which will be filed if the invention becomes the subject of a European patent application; or

b) the claims which will be filed if the invention becomes the subject of a European patent application, and a copy of a previous application whose priority is to be claimed if it is already in English, French or German, or if it is not, a translation of it into one of these languages.

For the present, no fee will be charged for this service.

The pre-classification request and the documents accompanying it will not be returned to the user of the service. The EPO will however maintain confidentiality in respect of these documents. It should be noted that documents relating to an invention sent to the EPO in connection with this service cannot form a basis for a claim to priority under the Paris Convention for the Protection of Industrial Property.

Potential users of this service are reminded of their responsibility for complying with any national legislative or regulatory provisions governing inventions which, owing to the nature of their subject matter, may not be communicated abroad without the prior authorisation of the competent authorities of the State in question, (cf Article 75, paragraph 2, EPC).

No person, irrespective of his state of residence or principal place of business, is compelled to act through the intermediary of a representative in using the service. However, natural or legal persons may make their request for the service through the intermediary of a representative. In this case, it is not necessary for the representative to file with the EPO an authorisation to act in this capacity.

This service will commence on 1 February 1978. Requests for the service should preferably be sent directly to or filed at the European Patent Office, Branch at The Hague, where they will be dealt with.

Postal address:
European Patent Office
PO Box No. 5818
NL–2280 HV Rijswijk ZH

Address for deliveries by hand:
European Patent Office
Patentlaan 2
Rijswijk ZH

Requests will also be accepted at the European Patent Office, Munich:

Postal address:
European Patent Office
PO Box 20 20 20
D–8000 München 2

Address for deliveries by hand:
European Patent Office
Rosenheimer Strasse 30
Motorama-Haus
München

Every effort will be made to provide a reliable service and to ensure that if the EPO assigns a provisional classification which is open for examination when the ensuing application is filed, that this application will be examined. However, the EPO can give no guarantee to that effect and therefore assumes no liability.

Request for the Pre-classification Service

Name and address of person making request:

To
The European Patent Office
PO Box No. 5818

NL - 2280 HV Rijswijk ZH

Date :
Reference :

The undersigned requests the European Patent Office to determine provisionally and communicate to him:

(i) in which sub-class or sub-classes of the International Patent Classification the invention set out in the accompanying documents falls;

(ii) whether this sub-class or one of these sub-classes will be on the list open for examination at the envisaged time of filing of the prospective European Patent application.

The envisaged time of filing of the prospective application is:

Month ..... Year .....*

signed .....

Accompanying documents (please tick where applicable):

- ☐ description
- ☐ drawings
- ☐ copy of previous application whose priority is to be claimed
- ☐ translation of previous application into English, French or German
- ☐ claims

*If the envisaged time of filing is not indicated, the EPO will still perform the service, but will indicate whether the sub-class or one of the sub-classes is open for examination at the time of performing the service.

May 8, 1978.

RENE D. TEGTMEYER.
Assistant Commissioner for Patents.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,077,724, Stoddard and Seem, APPARATUS FOR PROCESSING; **3,091,912,** same, **filed** Jan. 25, 1978, D.C., W.D.N.C. (Charlotte) Doc. C–C078–0020, *Lex Tex Ltd., Inc.* v. *American Barmag Corporation.*

3,091,912. (See 3,077,724.)

3,237,438, P. A. Tesson, PIPE LINE LAYING APPARATUS, **filed** Oct. 7, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3778–RF, *Martech Int'l Inc.* v. *Sante Fe Int'l Corp.* Filed plaintiff's notice of dismissal and voluntary dismissal of complaint and order thereon, Jan. 24, 1978.

3,259,291, R. S. Batt, BEARING, **filed** Apr. 14, 1977, D.C., S.D.N.Y., Doc. 77–C–1802 *Bell & Howell Co.* v. *McGraw Hill Inc.* Dismissal pursuant to Rule 41 (A) (1), Dec. 2, 1974.

3,291,908, K. Ehrat, PROCESS FOR THE CODING OF MESSAGES, **filed** Dec. 13, 1977, D.C., N.D. Tex. (Dallas) Doc. CA3–77–1610C, *Gretag Aktiengesellschaft* v. *Datotek Inc.*

3,425,508, E. W. Faulstich, EXTENSION LADDER, **filed** Aug. 20, 1976, D.C., Ill. (Chicago), Doc. 76c3106, *Eugene W. Faulstich* v. *Motac, Inc.*

3,471,112, MacDonald and MacDonald, COMBINATION SHELF SUPPORT AND ANCHOR, **filed** Jan. 23, 1978, D.C. Conn. (Hartford), Doc. H78–38, *P.X. Industries, Inc.* v. *Plastiglide Manufacturing Corporation.*

3,509,833, R. L. Cook, HARD FACED CERAMIC AND PLASTIC ARMOR, **3,516,898,** same, HARD FACED PLASTIC ARMOR, **filed** Jan. 30, 1978, United States Court of Claims (District of Columbia), Doc. 37–78, *Goodyear Aerospace Corporation* v. *The United States.*

3,516,898. (See 3,509,833.)

3,547,811, J. R. McWhirter, CYCLIC OXYGENATION OF BOD-CONTAINING WATER, **3,547,812,** same, HIGH OXYGEN UTILIZATION IN BOD-CONTAINING WATER TREATMENT, **3,547,813,** Robinson and McWhirter, BIOCHEMICAL OXIDATION WITH LOW SLUDGE RECYCLE, **3,547,815,** J. R. McWhirter, STAGED OXYGENATION OF BOD-CONTAINING WATER, **filed** May 2, 1975, D.C., S.D.N.Y., Doc. 2098, *Air Products and Chemical, Inc.* v. *Union Carbide Corporation.*

3,547,812. (See 3,547,811.)

3,547,813. (See 3,547,811.)

3,547,815. (See 3,547,811.)

3,762,907, Quinn and Kwiatkowski, GLASS FORMING MACHINE HAVING AN AUTOMATIC CONTROL SYSTEM, **3,967,703,** Kwiatkowski and Wood, PROGRAMMABLE AUTOMATIC CONTROLLER, **filed** Sept. 23, 1977, D.C., S.D. Tex. (Houston), Doc. CA H–77–1586, *Ball Corp. and Ball Packaging Products, Inc.* v. *Anchor-Hocking Corp.*

3,774,056, Sample and Scheuer and Speheger and Cox, DIGITAL ELECTRONIC CONTROL CIRCUIT FOR CYCLICALLY OPERABLE APPLIANCES AND THE LIKE, **filed** Feb. 22, 1978, D.C., S.D. Ohio (Cincinnati), Doc. C–1–78–92, *Design & Manufacturing Corp.* v. *Amana Refrigeration, Inc. and Ohio-Kentucky-Indiana Distr. Inc.*

3,804,251, Farrell and Bianchi and Johanson, FLOATAGE COLLECTING APPARATUS AND METHOD, **filed** Jan. 27, 1978, D.C. Conn. (New Haven), Doc. N–78–34, *JBF Scientific Corporation* v. *Sealand Environmental Engineering, Inc.*

3,827,107, R. R. Moore, ADJUSTABLE STRAP ASSEMBLY, **filed** Feb. 10, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–318 CBR *Robert R. Moore* v. *Orthopedic Technology, Inc.*

3,814,343, Bennett and Haller, AUTOMATIC TAPE LOADING APPARATUS FOR CASSETTES AND THE LIKE, **filed** May 19, 1975, D.C., Mass. (Boston), Doc. 75–1916–F, *Programming Technologies, Inc.* v. *King Instrument Corporation.*

3,867,806, Lancaster and Lancaster, PROCESS OF MAKING A STRETCHED WRAPPED PACKAGE, **filed** Dec. 20, 1977, D.C.N.J. (Newark), Doc. C–77–2596, *Lantech Inc.* v. *Packaging Sales & Development Corp.*

3,884,068, F. R. Dybel, LOAD SENSING DEVICE, **4,010,679,** same, PEIZOELECTRIC TRANSDUCER SENSOR FOR USE IN A PRESS, **4,048,848,** same, LOAD MONITORING SYSTEM, **filed** Nov. 28, 1977, D.C., S.D. Ohio (Cincinnati), Doc. C–1–77–710, *International Measurement & Control Company* v. *Pressco Inc.*

3,959,696, Lange and Peche, OVER VOLTAGE ARRESTER, **filed** Feb. 6, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c408, *Siemens Aktiengesellschaft* v. *Reliable Electric Company.*

3,969,703. (See 3,762,907.)

4,010,679. (See 3,884,068.)

4,011,431, M. L. Levin, ELECTRIC COOKING APPLIANCE WITH REVERSIBLE GRILL, **filed** Feb. 15, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–621–LTL(Sx), *Winnie Mae Manufacturing Co., Inc.* v. *Scovill Manufacturing Company.*

4,048,848. (See 3,884,068.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,169, Re. S.N. 882,821, Filed Mar. 2, 1978, Cl. 195/103.5 A, PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF REACTION COMPONENTS HAVING SPECIFIC BINDING AFFINITY FOR EACH OTHER, Antonius Hermanus Wilhelmus Maria Schuurs, et al., Owner of Record: *by mesne assignments to Akzona Incorporated, Asheville, N.C.,* Attorney or Agent: Robert H. Falk, et al., Ex. Gp.: 172

3,543,949, Re. S.N. 897,298, Filed Apr. 17, 1978, Cl. 214/8.5, CONTAINER DEPALLETIZING APPARATUS, Roman J. Weier, Owner of Record: *Wyard Industries Inc., Forest Lake, Minn.,* Attorney or Agent: John C. Barnes, Ex. Gp.: 314

3,611,494, Re. S.N. 900,021, Filed Apr. 28, 1978, Cl. 425/376 R, EXTRUSION HEAD FOR EXTRUDING ANNULAR ARTICLES OF THERMOPLASTIC MATERIAL, Harald Feuerherm, Owner of Record: *Kautex-Werke Reinold Hagen, Rheinland, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 322

3,949,354, Re. S.N. 893,569, Filed Apr. 5, 1978, Cl. 340/18 LD, APPARATUS FOR TRANSMITTING WELL BORE DATA, Jackson R. Claycomb, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: David L. Moseley, et al., Ex. Gp.: 222

3,949,687, Re. S.N. 896,195, Filed Apr. 12, 1978, Cl. 112/77, DEVICE FOR USE WITH BOTTONHOLE ATTACHMENT, Howard B. Julien, Owner of Record: *Inventor,* Attorney or Agent: Manfred M. Warren, et al., Ex. Gp.: 353

3,962,602, Re. S.N. 897,299, Filed Apr. 17, 1978, Cl. 315/370, SIDE PINCUSHION CORRECTION SYSTEM, Wolfgang Friedrich Wilhelm Dietz, Owner of Record: *RCA Corporation, New York, N.Y.,* Attorney or Agent: Eugene M. Whitacre, et al., Ex. Gp.: 222

3,994,990, Re. S.N. 881,080, Filed Mar. 27, 1978, Cl. 260/857, OPTICALLY BRIGHTENED NYLON MONOFILAMENT FISHING LINE, Danny R. Foote, Owner of Record: *Berkley & Company, Inc., Spirit Lake, Iowa,* Attorney or Agent: Orrin M. Haugen, et al., Ex. Gp.: 142

4,001,850, Re. S.N. 896,074, Filed Apr. 13, 1978, Cl. 354/219, DATA RECORDING CAMERA, Susumu Fujita, Owner of Record: *Fuji Photo Film Co., Ltd., Kanagawa-Ken, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 211

4,024,979, Re. S.N. 885,696, Filed Mar. 13, 1978, Cl. 220/71, HANDLING RING FOR PLASTIC DRUM, Walter J.

Craig, et al., Owner of Record: *Plastic Drum Inc., Lockpart, Ill.,* Attorney or Agent: Robert L. Lindgren, Ex. Gp.: 241

4,050,851, Re. S.N. 896,405, Filed Apr. 14, 1978, Cl. 417/68, LIQUID RING PUMPS AND COMPRESSORS USING A FERROFLUIDIC RING LIQUID, Harold K. Haavik, Owner of Record: *The Nash Engineering Company, Norwalk, Conn.,* Attorney or Agent: Albert C. Nolte, Jr., et al., Ex. Gp.: 343

4,053,648, Re. S.N. 886,197, Filed Apr. 7, 1978, Cl. 426/117, BOTTLE FOR STERILE DISPENSING OF FLOWABLE CONTENTS, Manfred Carl Schmid, et al., Owner of Record: *Inventor,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 177

4,059,867, Re. S.N. 869,922, Filed Jan. 16, 1978, Cl. 16/110 A, HANDLE FOR UTENSILS, Robert J. Adamis, Owner of Record: *Inventor,* Attorney or Agent: George B. White, Ex. Gp.: 353

PATENT NOTICES

Certificates of Correction for the Week of June 6, 1978

P.P.4,165	4,045,933	4,066,304	4,072,656
D.246,544.	4,046,891	4,066,390	4,072,866
D.247,414	4,047,154	4,066,521	4,073,025
3,363,415	4,048,437	4,066,589	4,073,052
3,477,225	4,049,052	4,066,627	4,073,053
3,852,254	4,049,626	4,066,744	4,073,077
3,951,942	4,050,651	4,066,835	4,073,086
3,968,994	4,051,332	4,066,918	4,073,123
3,983,135	4,051,527	4,067,063	4,073,176
3,988,361	4,051,707	4,067,170	4,073,294
3,994,875	4,052,348	4,067,253	4,073,329
3,997,685	4,052,350	4,067,377	4,073,395
3,999,008	4,052,703	4,067,543	4,073,420
4,001,421	4,053,379	4,067,577	4,073,427
4,002,808	4,053,834	4,067,719	4,073,563
4,003,768	4,054,569	4,067,755	4,073,765
4,004,762	4,054,671	4,067,911	4,073,822
4,006,722	4,054,836	4,068,034	4,073,881
4,007,121	4,054,974	4,068,243	4,073,934
4,007,161	4,055,431	4,068,267	4,073,942
4,012,357	4,055,486	4,068,292	4,073,976
4,013,573	4,055,551	4,068,574	4,073,988
4,014,595	4,056,520	4,068,937	4,074,027
4,016,542	4,056,996	4,069,210	4,074,189
4,021,049	4,057,437	4,069,278	4,074,249
4,021,313	4,057,952	4,069,327	4,074,363
4,021,440	4,058,165	4,069,389	4,074,365
4,022,767	4,058,194	4,069,390	4,074,446
4,022,786	4,058,403	4,069,675	4,074,472
4,023,516	4,058,500	4,069,688	4,074,572
4,024,264	4,058,709	4,069,725	4,074,662
4,024,545	4,058,851	4,069,946	4,074,783
4,027,064	4,058,853	4,069,995	4,075,017
4,027,214	4,058,991	4,070,124	4,075,174
4,027,516	4,059,027	4,070,418	4,075,178
4,028,333	4,059,250	4,070,473	4,075,257
4,028,419	4,059,618	4,070,697	4,075,261
4,031,533	4,059,819	4,070,759	4,075,286
4,032,082	4,060,735	4,070,954	4,075,329
4,032,561	4,061,209	4,071,122	4,075,360
4,032,825	4,061,580	4,071,295	4,075,729
4,034,014	4,061,978	4,071,573	4,075,805
4,035,912	4,062,730	4,071,602	4,075,924
4,038,384	4,063,036	4,071,650	4,076,170
4,039,324	4,063,221	4,071,709	4,076,231
4,039,688	4,064,182	4,071,793	4,076,246
4,043,339	4,064,872	4,071,815	4,076,288
4,044,142	4,064,874	4,071,845	4,076,360
4,044,231	4,065,179	4,071,878	4,076,941
4,044,675	4,065,225	4,071,880	4,076,977
4,044,716	4,065,237	4,072,010	
4,044,804	4,065,242	4,072,302	
4,045,438	4,065,635	4,072,360	
4,045,496	4,065,788	4,072,370	
4,045,516	4,066,181	4,072,481	

Disclaimers

Reissue No. 29,016.—*George Raymond Peacock*, Louisville, Ky. WELDING AND FORMING METHOD. Patent dated Oct. 26, 1976. Disclaimer filed Apr. 4, 1978, by the assignee, *Thermatool Corp.*

Hereby enters this disclaimer to claims 7 and 13 through 18 of said patent.

3,676,158.—*Leonard G. Fischer*, College Point, N.Y., and *Philip Wong*, Bergenfield, N.J. METHOD OF FORMING AN ADHERENT COATING ON FOODS. Patent dated July 11, 1972. Disclaimer filed Mar. 15, 1978, by the assignee, *DCA Food Industries, Inc.*

Hereby enters this disclaimer to claims 1 to 11 of said patent.

4,071,941.—*La Vern E. Sweet*, Chino, Calif. METHOD FOR ASSEMBLYING IMPROVED TRUSS JOIST. Patent dated Feb. 7, 1978. Disclaimer filed Apr. 5, 1978, by the inventor.

The term subsequent to Feb. 7, 1995 has been disclaimed.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE ARMY

Office of Judge Advocate General, Patent Division, Room 2C-455, Pentagon, Washington, D.C. 20314

Patent 3,995,792. Laser Missile Guidance Systems. Filed Oct. 15, 1974. Patented Dec. 7, 1976. Not available NTIS.

Patent 4,001,287. Reaction Product of Normal Lead Beta Resorcylate and Monobasic Cupric Salicylate. Filed Feb. 18, 1972. Patented Jan. 4, 1977. Not available NTIS.

Patent 4,002,064. Rifled Soft Recovery System. Filed Feb. 19, 1976. Patented Jan. 11, 1977. Not available NTIS.

Patent 4,002,123. Dual Channel Redundant Fuze. Filed July 11, 1975. Patented Jan. 11, 1977. Not available NTIS.

Patent 4,003,659. Single Plane Corner Reflector Guidance System. Filed Nov. 15, 1974. Patented Jan. 18, 1977. Not available NTIS.

Patent 4,003,953. Purification of TNT With Magnesium Sulfite-Bisulfite Mixtures. Filed Feb. 23, 1976. Patented Jan. 18, 1977. Not available NTIS.

Patent 4,004,754. High-Speed, High-G Air Bearing Optical Mount for Rosette Scan Generator. Filed July 11, 1974. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,931. Sealed Cassette for Optical Sound Projection. Filed Jan. 15, 1974. Patented Feb. 1, 1977. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research and Agreements and Patent Branch, General Services Div., Federal Building, Agricultural Research Service, Hyattsville, Md. 20782

Patent 4,056,354. Process for Rapid Dyeing of Textiles. Filed Feb. 10, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,064,283. Preparation of Protein Concentrates From Whey and Seed Products. Filed June 14, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,069,106. Immobilization of Enzymes on Keratin. Filed Jan. 13, 1977. Patented Jan. 17, 1978. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service
5285 Port Royal Road
Springfield, Va. 22161

Patent application 868,356. Inverse Fourth Power Photometric Calibrator. Filed Jan. 10, 1978.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,016,242. Salts of the Iodine Oxyacids in the Impregnation of Adsorbent Charcoal for Trapping Radioactive Methyliodide. Filed Feb. 26, 1976. Patented Apr. 5, 1977. Not available NTIS.

Patent 4,016,304. Method for Applying Pyrolytic Carbon Coatings to Small Particles. Filed June 17, 1975. Patented Apr. 5, 1977. Not available NTIS.

Patent 4,017,253. Fluidized-Bed Calciner With Combustion Nozzle and Shroud. Filed Sept. 16, 1975. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,417. Immobilization of Iodine in Concrete. Filed July 30, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,020,004. Conversion of Radioactive Ferrocyanide Compounds to Immobile Glasses. Filed Nov. 21, 1975. Patented Apr. 26, 1977. Not available NTIS.

Patent 4,020,692. Ultrasonic Thermometer Isolation Standoffs. Filed Sept. 26, 1975. Patented May 3, 1977. Not available NTIS.

Patent 4,020,693. Acoustic Transducer for Nuclear Reactor Monitoring. Filed Apr. 12, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,021,300. Improved Nuclear Fuel Assembly Grid Spacer. Filed May 23, 1975. Patented May 3, 1977. Not available NTIS.

Patent 4,021,676. Waste Canister for Storage of Nuclear Wastes. Filed May 7, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,025,602. Recovery of Transplutonium Elements From Nuclear Reactor Waste. Filed May 25, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,026,763. Liquid-Metal Dip Seal With Pneumatic Spring. Filed Apr. 12, 1976. Patented May 31, 1977. Not available NTIS.

Patent 4,027,156. X-Ray Source Safety Shutter. Filed May 25, 1976. Patented May 31, 1977. Not available NTIS.

Patent 4,028,180. Support Grid for Fuel Elements in a Nuclear Reactor. Filed Mar. 16, 1976. Patented June 7, 1977. Not available NTIS.

Patent 4,028,265. Process for Converting Sodium Nitrate Containing, Caustic Liquid Radioactive Wastes to Solid Insoluble Products. Filed Aug. 25, 1975. Patented June 7, 1977. Not available NTIS.

Patent 4,028,545. Method of Simulating Spherical Voids for Use as a Radiographic Standard. Filed Feb. 17, 1976. Patented June 7, 1977. Not available NTIS.

Patent 4,028,811. Tubular Gage for a Liquid-Metal-Cooled Fast Breeder Reactor. Filed Mar. 2, 1976. Patented June 14, 1977. Not available NTIS.

Patent 4,029,123. Pump Tank Divider Plate for Sump Suction Sodium Pumps. Filed Aug. 20, 1975. Patented June 14, 1977. Not available NTIS.

Patent 4,031,387. Method of Determining Whether Radioactive Contaminants are Inside or Outside a Structure. Filed Aug. 5, 1076. Patented June 21, 1977. Not available NTIS.

Patent 4,032,400. Nuclear Reactor Fuel Element With Vanadium Getter on Cladding. Filed Feb. 17, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,032,614. Process for the Disposal of Alkali Metals. Filed Oct. 20, 1975. Patented June 28, 1977. Not available NTIS.

Patent 4,032,615. Method for the Safe Disposal of Alkali Metal. Filed Jan. 27, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,033,813. Method of Detecting Leakage of Reactor Core Components of Liquid Metal Cooled Fast Reactors. Filed Oct. 22, 1975. Patented July 5, 1977. Not available NTIS.

Patent 4,036,688. Apparatus for Controlling Molten Core Debris. Filed Apr. 9, 1975. Patented July 19, 1972. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

National Institutes of Health, Chief, Patent Branch,
Westwood Building, Bethesda, Md. 20014

Patent application 817,377. Preparation of 2,4,5,6-Tetraaminopyrimidine From 2,4,6-Triaminopyrimidine. Filed July 20, 1977.

Patent application 823,142. Slide Valve. Filed Aug. 9, 1977.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent 4,036,581. Igniter. Filed Sept. 3, 1976. Patented July 19, 1977. Not available NTIS.

Patent 4,042,814. Electro-Optic Binary Adder. Filed June 28, 1976. Patented Aug. 16, 1977. Not available NTIS.

Patent 4,044,271. Monolithic NTDS Driver and Receiver. Filed Sept. 9, 1974. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,046,993. Target for Torpedo Launch System. Filed June 28, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,047,148. Piston Type Underwater Sound Generator. Filed Feb. 29, 1956. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,047,380. Combustion System Using Dilute Hydrogen Peroxide. Filed Apr. 9, 1976. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,048,942. Helicopter Towline Recovery Buoy System. Filed Feb. 22, 1977. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,049,402. Gas Mixing Device. Filed Nov. 6, 1975. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,050,243. Combination Solid Fuel Ramjet Injector/Port Cover. Filed May 17, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,364. Photoparamp Array Multiplexer. Filed Aug. 6, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,439. Short Pulse Magnetron Transmitter. Filed Nov. 2, 1972. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,799. Radial Depressor. Filed June 28, 1976. Patented Oct. 4, 1977. Not available NTIS.

Patent 4,056,386. Method for Decomposing Iron Pentacarbonyl. Filed Apr. 19, 1977. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,056,560. N,N'-Bis(3,4-Dicyanophenyl) Alkanediamides. Filed July 23, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,056,802. Soner Alarm System. Filed Mar. 10, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,057,000. Mechanism for Deep Ocean Instrumentation Remote Release. Filed Sept. 20, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,057,569. Bisorthodinitriles. Filed Apr. 28, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,057,719. Fiber Optics Electro-Mechanical Light Switch. Filed Aug. 27, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,058,722. Electro-Optic Analog/Digital Converter. Filed Sept. 29, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,060,798. Method for Increasing the Critical Velocity of Magnetic Bubble Propagation in Magnetic Materials. Filed May 12, 1976. Patented Nov. 29, 1977. Not available NTIS.

Patent 4,062,883. Polymer-Bound Metallocarborane Catalyst Product and Process. Filed Aug. 6, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,006. High Power Battery With Liquid Depolarizer. Filed Feb. 28, 1977. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,064,783. Pressure-Balanced Underwater Structural Release System. Filed Jan. 27, 1977. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,509. Synthesis of Beta-Methyl Derivatives of 2,4-Dicarba-Closo-Heptaborane-7. Filed May 25, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,066,965. RF GTWT Saturating Circuit. Filed Sept. 28, 1976. Patented Jan. 3, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent 4,062,245. Motion Restraining Device. Filed Apr. 30, 1977. Not available NTIS.

Patent 4,062,347. Solar Heating System. Filed Aug. 24, 1976. Patented Aug. 24, 1976. Not available NTIS.

Patent 4,063,282. TV Fatigue Crack Monitoring System. Filed July 20, 1976. Patented Dec. 13, 1976. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 6, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-20-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-1-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-25-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-30-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-21-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-7-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-21-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-13-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 6, 1978

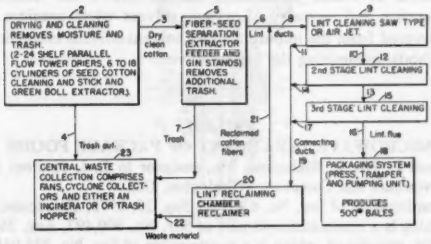
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T971,001
LINT-COTTON RECLAIMING APPARATUS FOR COTTON GINS

Gino J. Mangialardi, Jr., Greenville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,571
Int. Cl.² D01B *1/02*
U.S. Cl. 19—202
5 Sheets Drawing. 11 Pages Specification

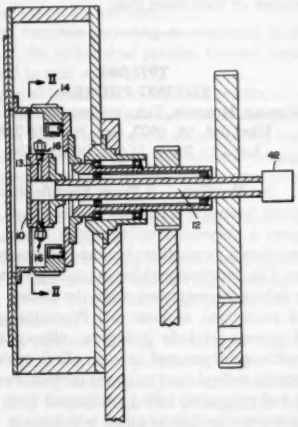

DRYING AND CLEANING REMOVES MOISTURE AND TRASH. (2-24 SHELF PARALLEL FLOW TOWER DRIERS, 6 TO 18 CYLINDERS OF SEED COTTON CLEANING AND STICK AND GREEN BOLL EXTRACTOR).
Dry clean cotton
FIBER-SEED SEPARATION (EXTRACTOR FEEDER AND GIN STANDS) REMOVES ADDITIONAL TRASH.
Lint
ducts
LINT CLEANING SAW TYPE OR AIR JET.
2nd STAGE LINT CLEANING
3rd STAGE LINT CLEANING
Lint flue
Trash
Trash out
Reclaimed cotton fibers
Connecting ducts
CENTRAL WASTE COLLECTION COMPRISES FANS, CYCLONE COLLECTORS AND EITHER AN INCINERATOR OR TRASH HOPPER.
LINT RECLAIMING CHAMBER RECLAIMER
PACKAGING SYSTEM (PRESS, TRAMPER AND PUMPING UNIT).
PRODUCES 500# BALES
Waste material

An apparatus to reclaim lint-cotton and return it to the ginning process is disclosed. The apparatus comprises in combination a unique arrangement of condensing cylinders, feed cylinders, saw cylinders, grid bars, and doffing brushes used to collect, reclaim, and feed back lint-cotton into the ginning system.

T971,002
ADJUSTABLE NOZZLE

Thomas L. Mitchell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 15, 1976, Ser. No. 666,735
Int. Cl.² F01M *9/00*
U.S. Cl. 184—6.14
2 Sheets Drawing. 14 Pages Specification



In a system including a first member and a second member movable relative the first member, an adjustable nozzle element is included. The nozzle directs pressurized fluid such as a lubricant or coolant delivered to the first member outwardly in a range of possible directions to impact the second member.

T971,003
SYNTHESIS OF DIMALEIMIDES

Gus George Orphanides, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1975, Ser. No. 645,219
Int. Cl.² C07D *403/06, 403/02*
U.S. Cl. 260—326.26
No Drawing. 12 Pages Specification

Bifunctional maleimides can be prepared in high yield by reacting an organic diamine with maleic anhydride in a solvent composed of the azeotrope of hexamethylphosphoramide or 1-methyl-2-pyrrolidone and acetic acid, followed by dehydration of the intermediate with acetic anhydride in the presence of an alkali metal salt of a C_2–C_3 aliphatic acid. The solvent systems are recoverable by reduced pressure distillation and can be used in subsequent syntheses of maleimides.

T971,004
FOAM PLASTICS

Colin Malcolm Roy Dunn, Biggleswade, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 8, 1977, Ser. No. 822,910
Claims priority, application United Kingdom, Sep. 6, 1976, 36820/76
Int. Cl.² B29D *27/00*
U.S. Cl. 264—53
No Drawing. 12 Pages Specification

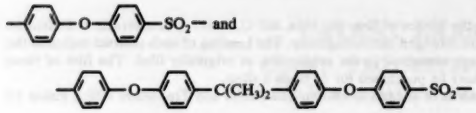
A process for the manufacture of a foamed thermoplastic aromatic polyethersulphone comprising heating a solid thermoplastic composition comprising an aromatic polyethersulphone which is not in admixture with another type of thermoplastic polymer, said composition containing 0.25 to 20% by weight of an absorbed volatile liquid selected from water, acetone, ethyl acetate, methyl ethyl ketone, methylene chloride and chloroform, to a temperature above (Tg-50)° C where Tg is the glass/rubber transition temperature of the thermoplastic polyethersulphone.

Preferably the thermoplastic composition contains 0.5 to 20% and particularly 1 to 20% by weight, of the absorbed volatile liquid.

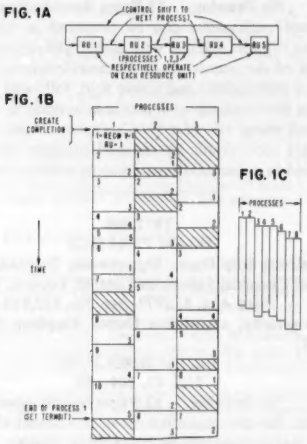
The solid thermoplastic composition may be in the form of a powder or granules so as to produce a foamed puff-ball type of structure or it may be in the form of a shaped article such as a sheet, film, coating, moulding or extrusion so as to produce a foamed shaped article. The heating may be effected using an air oven, a microwave oven or by immersion of the composition in the form of a shaped article in a fluidized bed or bath of a suitable material heated to the desired temperature.

The volatile liquid may be incorporated into the composition by exposing the polyethersulphone to an atmosphere of the liquid and more particularly by immersing the polyethersulphone in the volatile liquid. Where the volatile liquid has a solvent affinity for the polyethersulphone, granules or powder soaked in the liquid may flow together to form a product which becomes a foamable solid after the excess volatile liquid has been allowed to evaporate.

Examples of polyethersulphones employed in the foaming process have the repeat units



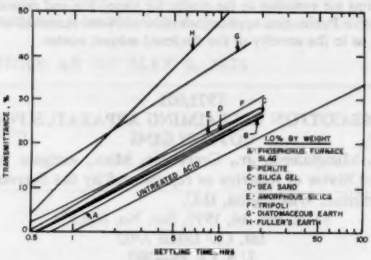
T971,005
METHOD FOR SYNCHRONIZING SETS OF INTERACTING PROCESSES
William Wilkinson Collier, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 425,358, Dec. 17, 1973, abandoned, which is a continuation of Ser. No. 212,282, Dec. 27, 1971, abandoned. This application May 13, 1977, Ser. No. 796,786
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—300
6 Sheets Drawing. 32 Pages Specification



Allows a set of processes to operate cyclically on a set of shared resources (e.g. I/O buffers). Each process is allowed to proceed at its own speed, subject only to a synchronization condition that it does not operate simultaneously on a resource with any member of the next (cyclic) subset of processes.

T971,006
PURIFICATION OF PHOSPHORIC ACID SOLUTIONS
Anthony J. Smith, Florence, Ala., assignor to Tennessee Valley Authority
Filed Sep. 14, 1977, Ser. No. 833,191
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—321 R
1 Sheets Drawing. 20 Pages Specification

An improved method of purifying wet-process phosphoric acid by sedimentation, in which the crude acid is intimately mixed with an appropriate amount of finely divided silica or silicate. The result is that the absolute magnitude of the zeta potential of the suspended solids, particularly humus and gypsum, decreases to a value that allows them to aggregate, settle rapidly, and be removed by conventional methods. The Si:F ratio is increased, effecting a reduction of fluorine contamination. The rate of growth of gypsum crystals is increased, reducing the amount of post-precipitation of gypsum and other particulates. Because the rate of settlement is increased, the holding time prior to further processing, such as concentrating to merchant-grade acid, is decreased, reducing storage and space requirements and associated capital investment as well as investment in product inventory. The sedimentation of solids concentrates and purifies the acid, allowing production of



liquid and solid fertilizers containing fewer impurities. The removal of solids, particularly humus, allows the efficient separation and recovery of organic solvent when uranium is recovered from the impure acid by solvent-solvent extraction methods, minimizing the loss of solvent.

T971,007
MICROWAVE TREATMENT OF PACKAGE FOODS
James L. Hecht, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 616,834, Sep. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 500,497, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 375,048, Jun. 29, 1973, abandoned. This application Aug. 11, 1976, Ser. No. 713,353
Int. Cl.[2] A23L *3/00*
U.S. Cl. 426—234
1 Sheets Drawing. 16 Pages Specification

The shelf-life of food is improved by sterilizing such food by heating it in a container having oxygen barrier properties, by microwave energy, for a time and temperature necessary to product sterilization. Such container is formed of a laminate including an organic polymeric material coated with an inorganic glassy barrier material and with a heat-sealable topcoat. The coating is from 0.02 to 2 microns thick and includes over 50% metal phosphate selected from aluminum and iron phosphates. The atom ratio of metal to phosphorus is about from 2.2 to 0.5 and up to about 50% of the metal ions may be replaced by tin, titanium or zirconium ions.

T971,008
FOXING PRIMER
David R. Hansen, Houston, Tex., assignor to Shell Oil Company
Filed Jul. 18, 1977, Ser. No. 816,788
Int. Cl.[2] B32B *25/00;* D03D *1/00*
U.S. Cl. 428—266
No Drawing. 9 Pages Specification

An improved footwear assembly is disclosed comprising a textile upper, a polymeric soling and a foxing wherein the foxing comprises a monoalkenyl arene-conjugated diene block copolymer. The improvement lies in coating at least the area of the upper which is contacted with the foxing with a silane compound containing at least one functional group. These functional groups include halogens, alkoxy groups, alkyl amines, methacryloxypropyl groups, alkyl mercapto groups, alkyloxy epoxy radicals and mixtures thereof. Preferably, both the foxing and polymeric soling are formed from compositions containing styrene-butadiene block copolymers.

REISSUES

JUNE 6, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

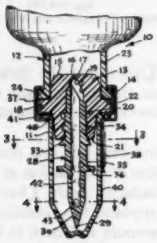
Re. 29,656
ADDITIVE TRANSFER UNIT HAVING A SLIDABLE PIERCING MEMBER

Richard Marion Chittenden, Grayslake; Peter Lorin Bryant, Lake Bluff, and Charles Carlock Classen, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Original No. 3,987,791, dated Oct. 26, 1976, Ser. No. 600,665, Jul. 31, 1975. Continuation of Ser. No. 465,230 Mar. 29, 1974, abandoned. Application for reissue Mar. 21, 1977, Ser. No. 779,455

Int. Cl.[2] A61J *1/00*

U.S. Cl. 128—272.3 **7 Claims**



1. An additive transfer unit for storing and transferring of a medicament to a *solution* container having an exposed closure [and a vacuum therein];

said transfer unit comprising [a] *an additive* container for storing the medicament to be transferred, said *additive* container having a rigid neck portion defining a finish, the opening in said *additive* container being sealed by a closure affixed thereto;

said closure having a shoulder for resting against said finish of the rigid container neck, said closure including a puncturable stopper with a pierceable diaphragm portion positioned in sealing engagement with the opening in the *additive* container and in a substantially stationary manner;

a tubular member having a cylindrical portion, the cylindrical portion including a central opening therein for slidably receiving a piercing member;

said tubular member including an undercut in the outside surface of the cylindrical portion thereof, sealing means positioned in said undercut;

a hood engageable with the cylindrical portion of the tubular member and the sealing means to cover the piercing member and tubular member prior to use of the unit;

said tubular member being positioned and arranged so that the opening therein overlies the diaphragm portion of said stopper;

crimping means to affix the closure and tubular member to the *additive* container;

said piercing member being positioned within said central opening in said member and having a passageway therethrough for the flow of said medicament and a point on both ends thereof;

said piercing member having an integral stop and being movable from the first position for entry through the closure of the [vacuumized] *solution* container with said integral stop constructed and arranged to contact said exposed closure of [vacuumized] *said solution* container to a second position for puncturing of the stopper in the additive container to thereby provide a pathway between the containers and permit the medicament within the additive container to transfer into the [vacuumized] *solution* container.

Re. 29,657
POWER DRIVEN SKI

Royce H. Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.

Original No. 3,853,192, dated Dec. 10, 1974, Ser. No. 404,411, Oct. 9, 1973. Application for reissue Dec. 1, 1976, Ser. No. 746,821

Int. Cl.[2] B62M *27/00*

U.S. Cl. 180—5 R **9 Claims**

1. In a power driven ski for [attachment to a skier's foot and for] slidingly negotiating snow as with a conventional ski, said power driven ski having in combination;

a. a ski with an aperture dividing it into an anterior ski portion having a longitudinally smooth anterior undersurface and a posterior ski portion,

b. a bridge holding said ski portions to each other,

[c. means for attaching said ski to a skier's foot,]

[d.] *c.* an endless tread circulateably supported around said posterior ski portion having at least one tension carrying member and a plurality of cleats attached to said tension carrying member for thrusting against the snow.

[e.] *d.* means for circulateably supporting said tread around said posterior ski portion, and

[f.] *e.* motor means coupled to said tread for circulating said tread around said posterior ski portion,

the improvement wherein the posterior ski portion has a longitudinally smooth, snow contacting stationary undersurface and said bridge holds said ski portions in position one relative to the other so that said undersurfaces jointly form a longitudinally smooth skiing undersurface substantially throughout the length of said ski.

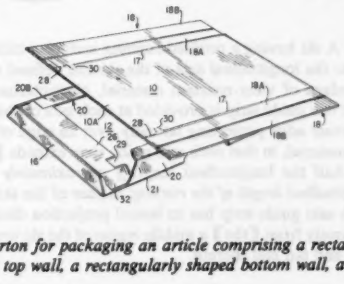
Re. 29,658
BOOK CARTON WITH IMPROVED OPENER

Benjamin Rous, New York, N.Y., assignor to Stone Container Corporation, Chicago, Ill.

Original No. 3,989,141, dated Nov. 2, 1976, Ser. No. 662,962, Mar. 1, 1976. Application for reissue Feb. 7, 1977, Ser. No. 766,434

Int. Cl.[2] B65D *85/54*

U.S. Cl. 206—424 **10 Claims**



6. In a carton for packaging an article comprising a rectangularly shaped top wall, a rectangularly shaped bottom wall, a pair

of trapezoidally shaped side walls foldably connected to each side of said bottom wall, one of said pair of side walls also being foldably connected to one side of said top wall, a first pair of end flaps, each of said first end flaps being foldably connected to one end of said bottom wall along a first folding line, each of said first end flaps including an inner portion and an outer portion, said inner portion being foldably connected to said outer portion along a third folding line, said end flap inner portion being foldably connected to said bottom wall and being coextensive in length with said bottom wall, the improvement comprising said first end flap outer portion being a first predetermined amount (X) shorter in length than said end flap inner portion, said first end flap outer portion being equal to width to a second predetermined amount (L), a closure flap being hingedly connected to the other of said pair of side walls, said closure flap having a pair of end portions extending inwardly from the ends of said closure flap a distance equal to the second predetermined amount (L), said closure flap end portions being equal in width to the first predetermined amount (X), said closure flap and said first end flap outer portions being normally positioned parallel to said bottom wall and being coplanar with each other.

Re. 29,659

RADIAL SKI HAVING A PROFILED RUNNING SURFACE

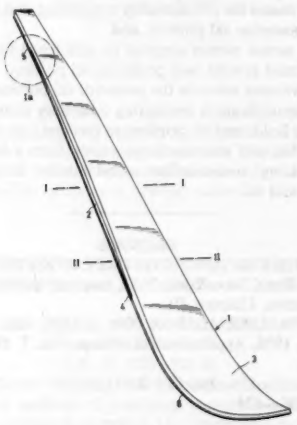
Heinz Helmut Bildner, Traunsteiner Strasse 57, 8221 Seebruck, Germany

Original No. 3,871,671, dated Mar. 18, 1975, Ser. No. 366,615, Jun. 4, 1973. Application for reissue Feb. 24, 1977, Ser. No. 771,836

Claims priority, application Germany, Jun. 8, 1972, 2227980; Feb. 27, 1973, 2309782

Int. Cl.[2] A63C *5/04*

U.S. Cl. 280—608 **10 Claims**



1. A ski having a profiled running surface which is symmetric to the longitudinal axis of the ski and defined at both sides by edges of wear-resistant material, characterized in that at least one guide strip is provided at each side of the ski forming a further edge projecting laterally over an edge of wear-resistant material, in that each said guide strip extends [in excess of one-half the longitudinal length] *approximately one-half the longitudinal length of the running surface* of the ski, and in that each said guide strip has its lateral projection diminished continuously from [the] *a* middle *region* of the ski towards the tip end and tail end thereof.

Re. 29,660

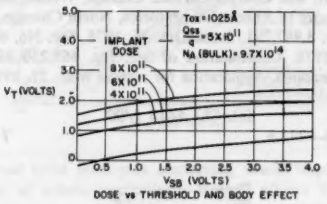
PROCESS AND PRODUCT FOR MAKING A SINGLE SUPPLY N-CHANNEL SILICON GATE DEVICE

William E. Armstrong, Mission Viejo, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Original No. 3,912,545, dated Oct. 14, 1975, Ser. No. 469,487, May 13, 1974. Application for reissue Mar. 7, 1977, Ser. No. 775,004

Int. Cl.[2] H01L *21/265*

U.S. Cl. 148—1.5 **16 Claims**



DOSE vs THRESHOLD AND BODY EFFECT

1. A process for [increasing the threshold voltage of an] *fabricating an inverter including serially* connected N-channel MOS devices *in a semiconductor substrate* comprising the step of:

implanting acceptor ions [of one conductivity type] into the channel *regions of both devices at the* surface portion of a *P-type* semiconductor body [having source and drain regions of the opposite type conductivity] at an energy level and in an amount sufficient to increase the threshold voltage of said MOS [device] *devices*.

Re. 29,661

SULFURIZED METAL PHENATES

Yngve Gust Hendrickson, El Cerrito, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Original No. 3,801,507, dated Apr. 2, 1974, Ser. No. 281,863, Aug. 18, 1972. Application for reissue Jul. 5, 1977, Ser. No. 812,940

Int. Cl.[2] C10M *1/54*

U.S. Cl. 252—42.7 **13 Claims**

1. A composition of matter prepared by reacting an alkyl phenol having from 8 to 35 carbon atoms in the alkyl group, sulfur and an alkaline earth metal base in the presence of a mutual solvent to form a sulfurized metal phenate having a sulfur to metal atom ratio between 1 and 4 *and an alkalinity value of 40 to 200 mg. KOH/gram.*

7. A process for producing a mixture of sulfurized metal phenates having a sulfur to metal atom ratio between 1 and 4 *and an alkalinity value of 40 to 200 mg. KOH/gram* which comprises:

a first contacting of 8.7 to 47 mol percent of an alkyl phenol having from 8 to 35 carbon atoms in the alkyl group, from 13 to 81 mol percent of sulfur, from 0.5 to 42 mol percent of an alkaline earth metal base and from 1.3 to 66 mol percent of a mutual solvent within a liquid reaction medium at a temperature of 250 to 450° F. and at a presence of 5 to 20 p.s.i.a. for a period of 1 to 6 hours, the mol ratio being maintained between 0.05 to 1.5 mols of metal base, 0.1 to 4 mols of mutual solvent and 1 to 5 mols of sulfur per mol of alkyl phenol; and

a second contacting of the reaction product obtained from said first contacting with 0 to 49 mol percent of said alkaline earth metal base, and from 17 to 80 mol percent of said mutual solvent at a temperature of 250 to 450° F. and a pressure of 2 to 15 p.s.i.a. for a period of 4 to 10 hours.

9. A process for producing a mixture of sulfurized metal phenates having a sulfur to metal atom ratio between 1 and 4 *and an alkalinity value of 40 to 200 mg. KOH/gram* which comprises:

contacting in a first step from 0.2 to 1 mol of an alkaline earth metal base, from 0.2 to 1 mol of a mutual solvent and from 1.5 to 3 mols of sulfur with each mol of an alkyl phenol having from 8 to 35 carbons; in the alkyl group said contacting being maintained at a temperature of 250 to 450° F. and a pressure of 5 to 20 p.s.i.a. for a period of 1 to 6 hours to produce a sulfurized intermediate reaction product; and

contacting in a second step said sulfurized intermediate reaction product with 0.2 to 0.6 mol of an alkaline earth metal base and from 0.5 to 2 mols of mutual solvent per mol of said alkyl phenol in said first step;

said contacting in the second step being maintained at a temperature of 250 to 450° F. and a pressure of 2 to 15 p.s.i.a. for a period of 2 to 10 hours to produce a sulfurized metal phenate mixture.

Re. 29,662

RARE EARTH ACTIVATED LANTHANUM AND LUTETIUM OXY-CHALCOGENIDE PHOSPHORS

Perry Niel Yocom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Original No. 3,418,247, dated Dec. 24, 1968, Ser. No. 696,490, Jan. 9, 1968. Continuation-in-part of Ser. No. 442,518, Mar. 24, 1965, abandoned. Application for reissue Apr. 4, 1977, Ser. No. 784,366

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 S **12 Claims**

1. A phosphor consisting essentially of an oxy-chalcogenide of at least one member of the group consisting of lanthanum and lutetium wherein up to [25] *15* mol percent of said lanthanum and lutetium is replaced with yttrium or gadolinium, said phosphor containing, for each mol of said phosphor, between 0.0002 and 0.2 mol of a member of the group consisting of dysprosium, erbium, europium, holmium, neodymium, praseodymium, samarium, terbium, and thulium.

Re. 29,663

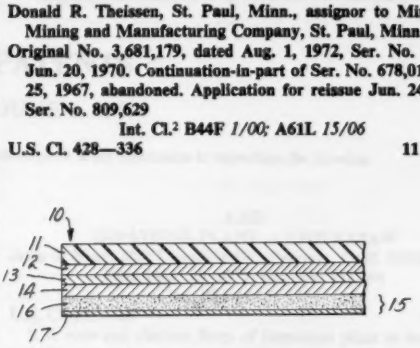
MOISTURE-RESISTANT SOLAR CONTROL FILM

Donald R. Theissen, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,681,179, dated Aug. 1, 1972, Ser. No. 56,379, Jun. 20, 1970. Continuation-in-part of Ser. No. 678,013, Oct. 25, 1967, abandoned. Application for reissue Jun. 24, 1977, Ser. No. 809,629

Int. Cl.² B44F *1/00*; A61L *15/06*

U.S. Cl. 428—336 **11 Claims**



1. Flexible adhesive-coated solar control film which is normally not tacky, can be wound on itself in roll form without the use of a protective liner, readily unwound and easily handled in large sheets but which is capable of being firmly, adherently but removably bonded to a glass sheet with a pressure-sensitive adhesive to provide a bubble-free transparent laminated structure, said solar control film comprising in combination:

a transparent film backing,

a thin transparent aluminum coating on one face of said backing,

a thin, transparent moisture-transmitting barrier layer coated over the aluminum,

a thin, transparent primer layer coated over said barrier layer, and

a water-activatable adhesive system comprising:

a uniform continuous layer of normally tacky water-insoluble pressure-sensitive adhesive coated over said primer layer and firmly adherently bonded thereto and

a thin, uniform continuous light-transmitting tack-free film-forming water-soluble material coated over and firmly bonded to said layer of pressure-sensitive adhesive,

whereby water may be applied to the water-soluble material to activate it and render its surface slippery, thus permitting the solar control film to be readily positioned on a glass windowpane in a desired location, after which excess water and water-soluble material can be expelled at the edges of said film and the remaining water evaporated through said film to permit the pressure-sensitive adhesive to bond firmly to said windowpane and form a laminated structure having excellent optical properties.

PLANT PATENTS

GRANTED JUNE 6, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,258

IMPATIENS PLANT MAYA

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,284
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated known by the cultivar name Maya and particularly characterized by its excellent floriferousness; good breaking action; making a full basket; giving good cutting production; red-green foliage like Mikkel Red Magic: fast growth habit; a light red-orange flower; and the ability to withstand adverse conditions.

4,259

IMPATIENS PLANT — NAVAJO

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,285
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated known by the cultivar name Navajo and particularly characterized by rich red-green foliage with a very distinct golden brown to off-yellow variegation; a medium size, rose-red flower with a light eye; a very erect, thick, stiff stem; and very good breaking action, making an excellent pot and/or bedding plant.

4,260

IMPATIENS PLANT — CHICKASAW

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,286
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated known by the cultivar name Chickasaw and particularly characterized by short internodes; many rose-pink flowers in the summer and salmon flowers in the winter; a bright yellow variegation on a moderately light green leaf under high light and increasing age of plants; and a stem and breaking action conducive to making a good basket.

4,261

IMPATIENS PLANT — CREEK

John J. Pyan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,287
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plants as described and illustrated, known by the cultivar name Creek and particularly characterized by its bright red-green foliage that grows in richness under high light; bright pink flower color with slightly darker eye; moderate flower size and average number of flowers; average growth habit for a New Guinea pot variety; but the chief distinction is the good flower to foliar contrast.

PLANT PATENTS

ORANTED JUNE 8, 1971

PATENTS

GRANTED JUNE 6, 1978

ERRATA

For CLASS	See PATENT NO.
072–275	4,092,875
010–024	4,092,913
010–088	4,092,914
400–144.2	4,093,059
400–236.1	4,093,060
400–194	4,093,061
220–462	4,093,114
274–009 R	4,093,152
366–336	4,093,188
366–156	4,093,189
283–001 R	4,093,276
134–104	4,093,472
350–355	4,093,534
544–344	4,093,616
544–281	4,093,617
544–387	4,093,618
568–766	4,093,667
568–855	4,093,668
235–001 E	4,093,848
235–302.2	4,093,851
362–104	4,093,973
363–027	4,093,975
358–053	4,093,976

PATENTS

GRANTED JUNE 6, 1978

GENERAL AND MECHANICAL

4,092,739

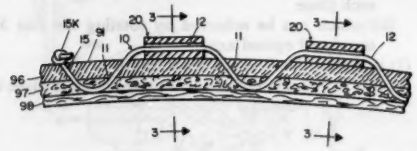
METHOD OF REPLACING HAIR

Richard P. Clemens, 1706 S. 91st Ave., Omaha, Nebr. 68124, and Robert Fuchs, 1908 Parkwild West, Council Bluffs, Iowa 51501

Continuation of Ser. No. 665,690, Mar. 10, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,942

Int. Cl.[2] A61B *17/00*; A61F *1/00*

U.S. Cl. 3—1 **3 Claims**



1. A method for replacing hair in a delineated area of a living human scalp which has been surgically prepared, said method comprising the steps of:

A. Positioning a plurality of individual tubular resinous sleeves atop the scalp skin layer and arranged in an annular pattern within said delineated area;

B. Providing distinct spatial gaps between the ends of neighboring tubular sleeves;

C. Embedding a series of sutures in an annular pattern utilizing an elongate one-piece surgical thread, the lead-end of which is inserted in repeated alternating fashion as follows:

i. through the scalp skin layer and restricted to the spatial gap between neighboring sleeves whereby there is provided suturing infra-lengths lying buried within the subcutaceous scalp layer; and

ii. through the longitudinal bore of the sleeves as a suturing supra-length said bore being sufficiently larger cross-sectionally than said suturing whereby each sleeve remains entirely atop the scalp skin layer and is slidable therealong;

D. Buttressing the sutured elongate one-piece surgical thread at its lead-end and trail-end thereby preventing the buried infra-lengths thereof from sliding within the subcutaceous layer; and

E. Applying at least one connector means to the sleeves and to which connector replacement hair might be attached.

4,092,740

ARTICULATED JOINT PROSTHESIS

Salomao Eshriqui, Rua Pampeu Loureiro No. 32, Bloco B-Apt. 402, Rio de Janeiro, Brazil

Filed Oct. 4, 1976, Ser. No. 729,100

Claims priority, application Brazil, Oct. 3, 1975, 750646

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.911 **9 Claims**

1. An articulated joint prosthesis comprising in combination:

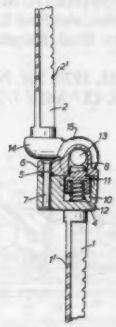
a first bone penetrating element for penetrating the marrow of a first bone associated with one side of said joint;

a second bone penetrating element for penetrating the marrow of a second bone associated with the other side of said joint;

articulation means having a normal plane of articulation comprising first hinge means on said first element and second hinge means on said second element, said first and second hinge means being operatively associated for articulation about a hinge axis; and

elastic bias means in operative relation with said first and second hinge means, permitting therebetween a limited rotational movement in a plane perpendicular to the normal plane of articulation of the articulation means;

said articulation means including a hinge pin defining said hinge axis and said bias means being positioned between said pin and said first hinge means;



said first hinge means including a bearing at each end of said pin and said bias means comprising separate elastic means forming part of each of said bearings.

4,092,741

PROSTHETIC DEVICE FOR USE AS A HIP JOINT

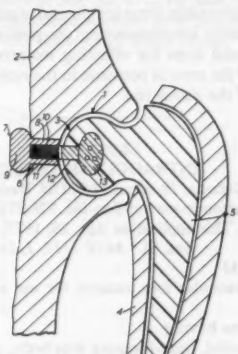
Thomas David, Vienna, Austria, assignor to Firma Ludwig Bertram GmbH & Co. KG, Hannover, Germany

Division of Ser. No. 699,841, Jun. 25, 1976, abandoned. This application Aug. 2, 1977, Ser. No. 821,174

Claims priority, application Austria, Jun. 26, 1975, 4941/75

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.913 **3 Claims**



1. A hip joint prosthesis comprising a substantially spherical portion capable of being anchored in the acetubular fossa of a pelvic bone, a shank portion capable of being anchored in a femur, the spherical portion and the shank portion being integral and being composed of an elastic material, fixing means associated with the spherical portion, and at least one holding member co-operable with the fixing means to anchor the spherical portion in the fossa, said holding member being anchorable in the pelvic bone by being inserted into a hole, previously made through the pelvic bone, from the side oppo-

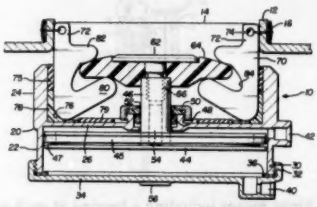
site the fossa and said holding member comprising a shaft for insertion into the hole in the pelvic bone, and a fixing head on the shaft engageable against the side of the pelvic bone opposite the fossa, the shaft of the holding member having a threaded hole and the fixing means comprising a fixing element having a threaded shaft extending from the spherical portion and engageable in the threaded hole.

4,092,742

DYNAMIC PROSTHETIC MYOCARDIUM

Adrian Kantrowitz, Pontiac, and Paul S. Freed, Oak Park, both of Mich., assignors to Sinai Hospital of Detroit, Detroit, Mich.

Filed Oct. 18, 1976, Ser. No. 733,677
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.7 **9 Claims**



1. A prosthetic myocardial device for replacing excised necrotic or scarred myocardial tissue to simulate contraction and relaxation during systole and diastole, comprising:

a plurality of essentially circumferentially arranged arms, with each of the arms being supported at one of its ends for pivotal movement and the other end of each arm being adapted for suture to the heart around the periphery of an opening formed by excising myocardial tissue; power means for effecting synchronous pivotal movement of said plurality of arms to simulate contraction and relaxation of the heart, including an hydraulic cylinder, a piston reciprocable within the cylinder, and a piston rod extending out of the cylinder and being essentially coaxial of the circumferentially arranged pivotal arms; and tilting means functionally interconnecting the piston rod and each of the pivotal arms for effecting reciprocal pivotal movement of the arms in response to the reciprocal axial movement of the piston rod.

4,092,743

INTRAOCULAR LENSES

Charles D. Kelman, 73 Bacon Rd., Old Westbury, N.Y. 12123

Continuation-in-part of Ser. No. 728,973, Oct. 4, 1976, abandoned. This application Apr. 28, 1977, Ser. No. 791,693
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **26 Claims**

1. An intraocular lens suitable for use as an artificial lens implant,

(A) the lens having

(1) a medial, light-focusing lens body, and

(2) a pair of lateral position fixation elements connected with said lens body,

(B) one of said position fixation elements having

(1) a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of said lens body, and

(2) a second portion extending from said first portion generally transversely thereto and at least partly peripherally of said lens body, said second portion having that part of its peripheral edge which faces said lens body spaced from the periphery of said lens body,

(C) and the other of said position fixation elements extending generally laterally outwardly

(1) from a second region of the periphery of said lens body spaced from and generally opposite said first region and

(2) in a direction generally opposite to that of said first portion of said one position fixation element,

(D) said pair of position fixation elements cooperating to effect proper positioning and immobilization of the lens with respect to the iris of an eye of a lens implant patient,

(E) the configurations of said position fixation elements and their location with respect to said lens body being such that

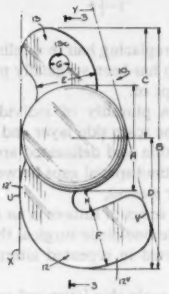
(1) the minimum length

(a) of a projection of the entire lens onto a plane parallel to the optical axis of said lens body in a direction perpendicular to a projection of said optical axis on such plane

(b) which can be achieved by rotating the lens 360° about said optical axis,

(2) is greater than the minimum length

(a) of a projection of said lens body onto said plane in a



direction perpendicular to a projection of said optical axis on such plane

(b) which can be achieved by rotating said lens body 360° about said optical axis,

(3) to an extent sufficient that insertion of the lens, through an incision in the eye, by a movement which is generally radial with respect to said optical axis would require the length of such incision to be greater than the minimum possible length of the incision which, as a function of the thickness and lateral dimensions of said lens body, would accommodate and permit passage therethrough of said lens body alone, and

(F) the maximum width of each of said position fixation elements at any part thereof for a given thickness thereof being such that that element can be accommodated in and pass longitudinally through said minimum length incision in the eye,

(G) whereby the entire lens is capable of being snaked into the eye of a lens implant patient through said minimum length incision.

4,092,744

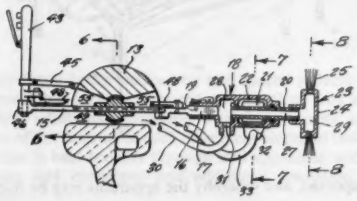
AUTOMATIC HYGIENIC WASHING MACHINE

Aristotel Butoi, 689 Seneca Ave., Ridgewood, N.Y. 11227

Filed Feb. 22, 1977, Ser. No. 770,441
Int. Cl.[2] A61H *35/00*; A46B *13/06*; G05G *9/04*
U.S. Cl. 4—7 **2 Claims**

1. An automatic hygenic washing machine, comprising in combination, a bracket mounted under a toilet seat, spherical ball retained freely rotatable in said bracket, a rod slidable through said ball, one end of a shank being pivotally connected to one end of said rod, a power unit being detachably supported by one of opposite end of said shank, a rotating brush detachably being supported on said power unit; said brush comprising a hollow flat, circular base having bristle tufts on a periphery thereof and openings on said periphery communica-

tion with an interior chamber of said base; said power unit including a case having a first chamber, a tubular shaft rotated in bearings of said case extending through said first chamber, a plurality of radials fins formed around an outer side of said shaft first chamber, an entry port and an outlet port from a cold water supply being connected to said entry port so that flow of said water through said first chamber cause said shaft to rotate, a second chamber inside said power unit case communicating with one end of a central opening through said shaft, said brush mounted upon an opposite end of said shaft, an interior of said base communicating with an opposite end of said shaft central



opening, a plurality of perforated openings through a peripheral wall of said extending brush bristle tufts around said base; an entry port on said second chamber, a flexible hose from a heated water supply being connected to said second chamber entry; a first link pivoted at one end to said toilet seat, a control lever adjacent a side of a toilet being tethered to an opposite end of said link, a lower end of said lever being rotatable in an opening on an opposite end of said rod, a sideward spur near a lower end of said lever, and a second link being pivotally connected to said spur, said second link being also connected to a sideward spur formed along an intermediate portion of said shank.

4,092,745

DRAIN STRUCTURE

Robert A. Oropallo, Pasadena, Calif., assignor to American Brass & Aluminum Foundry Co., Inc., Los Angeles, Calif.

Filed Dec. 13, 1976, Ser. No. 749,827
Int. Cl.[2] E03C *1/26*
U.S. Cl. 4—288 **11 Claims**

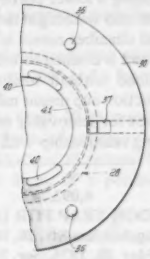
1. In a drain assembly for a drain floor having an opening toward which a drain pipe projects, the combination comprising:

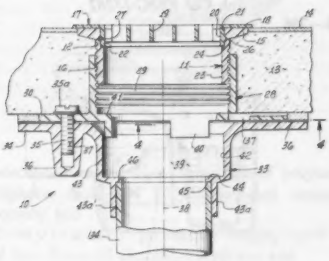
(a) a tubular plastic body sized to exteriorly fit the drain floor opening, the body having an external thread, and a nut threadably engaging the body thread and rotatable relative to the body, the nut defining an exterior flange, the body and nut consisting of molded plastic material, the body and nut having a common axis,

(b) a plate defining an upper flange overlapping the top of the body, and a grille bounded by the upper flange and overlapping the upper interior of the body,

(c) and a tubular base having a flange attached to the nut flange at the underside thereof, the base having a tubular portion projecting downwardly for reception of the upper extent of said pipe, said base consisting of molded plastic material,

(d) said nut including circularly spaced downward projections extending into the upper interior of the base, the nut defining at least one weep hole extending through the side of the nut at approximately the level of the nut flange to directly communicate with the space between the projections, said projections acting as stiffeners and centering





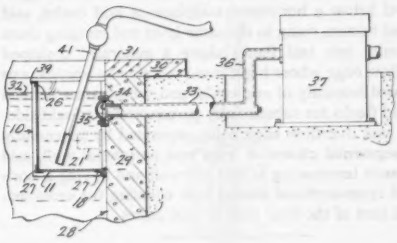
guides, said projections projecting closer to said axis than said thread.

4,092,746

SWIMMING POOL APPARATUS

Richard Harris, Archbold, Ohio, assignor to Mack and Gooding, Archbold, Ohio, a part interest

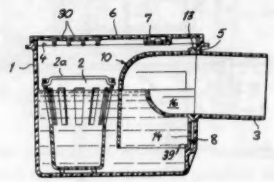
Continuation-in-part of Ser. No. 472,214, Mar. 22, 1974, abandoned. This application Apr. 20, 1976, Ser. No. 678,473
Int. Cl.[2] E04H *3/20*; E03B *11/00*
U.S. Cl. 4—172.17 **6 Claims**



1. Swimming pool apparatus for use on a pool filled with water up to a predetermined maximum level and having a side outlet positioned below the normal surface of the water in the pool, such outlet normally being filled with water, comprising, in combination, chamber means including a rectangular watertight box having an opening in one side for positioning in alignment with a pool outlet, sealing means for effecting a liquid seal between said chamber means and the pool adjacent the pool outlet, said sealing means including a gasket mounted on said watertight box adjacent such side opening, said sealing means preventing the pool water from entering said chamber means and the pool outlet, said chamber means including an upper portion which extends above the predetermined maximum water surface level when said chamber means is sealed to

the pool, said upper portion defining an opening located above the predetermined maximum water surface level, said chamber means further including a lower portion which extends below the pool outlet when said watertight means is sealed to the pool whereby, when said chamber means is sealed to the pool with said sealing means and is drained to below the pool outlet, the pool outlet is drained without lowering the normal water surface level, and suction cup means mounted on opposed sides of said watertight box for removably mounting said watertight box in a surrounding relationship with the pool outlet.

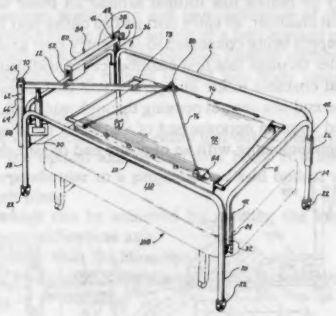
4,092,747
ODOR TRAP FOR DRAIN
Bernhard Kessel, Ingolstadter Str. 20, 8073 Kosching, Germany
Filed May 20, 1976, Ser. No. 688,309
Claims priority, application Germany, May 21, 1975, 2522425
Int. Cl.² E03C *1/282*
U.S. Cl. 4—286 **9 Claims**



1. An odor trap for a drain, comprising:
an upwardly open housing having a substantially flat sidewall provided with an exit port for entering waste water;
a tubular insert in said housing adjacent said sidewall, said insert having a peripheral wall forming a bottom inlet beneath the level of said exit port and a circular lateral outlet registering with said exit port;
mounting means securing said insert to said sidewall; and
an upwardly concave tongue in said insert spaced from said peripheral wall and extending inwardly from the lower periphery of said outlet, said tongue having a curved bottom hugging said outlet over substantially the lower third of its periphery and a pair of upstanding flanks on opposite sides of said curved bottom, said flanks rising to a level below a horizontal midplane of said outlet, said curved bottom rising to the same level and merging there gradually into said flanks along a generally U-shaped overflow edge whose bight is curved about a vertical axis disposed inwardly of said outlet and whose arms defined by said flanks are substantially perpendicular to said sidewall, said overflow edge being separated by a generally ring-segmental clearance from said peripheral wall, said clearance terminating at said sidewall and having a horizontal cross-sectional area at least equaling the cross-sectional area of the flow path of said outlet.

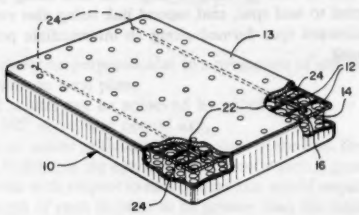
4,092,748
PATIENT HANDLING SYSTEM
Marion H. Ewers, Payson, Ariz., assignor to Air Rotor Development Company, Inc., Payson, Ariz.
Filed Jul. 16, 1976, Ser. No. 705,810
Int. Cl.² A61G *7/10*
U.S. Cl. 5—85 **8 Claims**

1. Apparatus for lifting and transporting bed patients from and to hospital beds comprising a stretcher a horizontally foldable rectangular frame having corner hinges, detent means to prevent folding of the frame from the rectangular position in use, hoist means carried by said frame and having means for engaging said stretcher a plurality of legs straddling the bed and supporting said frame above hospital bed height and means for moving the apparatus attached to said legs; whereby the frame may be positioned above the bed of a patient and the hoist means attached to the stretcher and the patient lifted up



and transported, and whereby the apparatus may be folded for storage.

4,092,749
MATTRESS SPRING UNIT CONSTRUCTION
Alvin R. Klancnik, Park Ridge, Ill., assignor to Sealy, Incorporated, Chicago, Ill.
Filed Jan. 6, 1977, Ser. No. 757,237
Int. Cl.² A47C *23/04*
U.S. Cl. 5—267 **37 Claims**

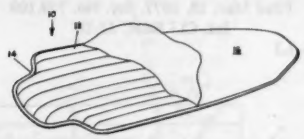


1. A retention and support strip for attachment to a mattress innerspring unit with cross helicals which extend transversely of the unit and lace together terminal convolutions of adjacent coil springs in the rows, to reduce spin-out of the cross helicals and increase firmness of the innerspring unit comprising:
a strip including leg members for extending about the cross helicals of the innerspring unit and for being crimped together with the cross helicals about the terminal convolutions of adjacent coil springs in a row when said strip overlies the terminal convolutions of the coil springs in a row.

4,092,750
INFLATABLE INSULATING APPARATUS
Donald G. Ellis, 2315 Broadway, No. 2, Boulder, Colo. 80302
Filed May 14, 1976, Ser. No. 686,653
Int. Cl.² A47G *9/00*
U.S. Cl. 5—343 **17 Claims**

1. An inflatable insulating apparatus for use as or in a mattress inflatable with a fluid comprising a plurality of fluid-tight envelopes; means for inserting a fluid therewithin to inflate said envelopes; and reflective means included on at least two spaced portions of each of said envelopes for reflecting a significant portion of the thermal radiation incident thereon, said two spaced portions including said reflective means being in general alignment with and opposing one another across at least a portion of each of said fluid-tight envelopes, each spaced portion including said reflective means intersecting a

path extending between a first surface of each of said envelopes adapted to engage a first object, person or the like being insulated and a second surface of each of said envelopes adapted to engage a second object, surface or the like from which the first object, person or the like is being insulated, whereby said apparatus in an insulator with heat transfer through and across



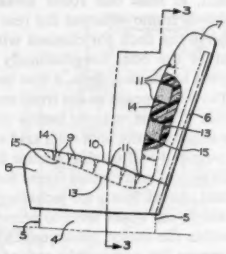
said envelopes being reduced by said spaced reflective means; said envelopes located adjacent one another; said apparatus including additional insulation material covering at least a portion of the exterior of each of said envelopes to facilitate the reduction in heat transfer through said apparatus; and a cover retaining said envelopes and additional insulation material together.

4,092,751

CONTOURED FOAM SEAT

Theodore B. Burkholder, Perrysburg, and Robert J. Stalter, Bowling Green, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 6, 1976, Ser. No. 683,975
Int. Cl.[2] A47C *23/00*
U.S. Cl. 5—345 R **6 Claims**



1. In an improved seat including a support means for a foamed body contact member, the improvement wherein the surface of the foamed body contact member has cored-out areas, said cored-out areas being positioned to give a geometric pattern of grooves that extend continuously in lengths no more than four inches before the grooves terminate or change direction to give raised portions, each portion being capable of being compressed independent of any other portion for at least 10 percent of its compression deflection.

4,092,752

FIRE RETARDANT BOX SPRING AND MATTRESS

Thomas P. Dougan, Newport Beach, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 29, 1976, Ser. No. 745,690
Int. Cl.[2] A47C *23/00*; B29H *17/28*
U.S. Cl. 5—345 R **6 Claims**

1. An improved box spring and mattress combination, said mattress being supported on said box spring wherein said mattress consists essentially of

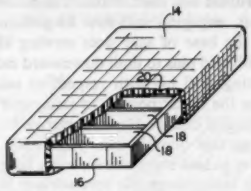
a homogeneous core of flame retarded flexible polyurethane foam which is the product of reaction, under foam producing conditions, of

(a) a polyisocyanate mixture which contains from 5 percent to 95 percent by weight of toluene diisocyanate and from 95 percent to 5 percent by weight of polymethylene polyphenyl polyisocyanate containing from about 40 percent to about 70 percent of methylenebis(-phenyl isocyanate), the remainder of said polymethylene polyphenyl polyisocyanates having a functionality higher than 2.0;

(b) a polyether polyol having an equivalent weight from about 500 to about 2500 and a functionality from about 2.0 to about 4.0;

(c) from about 2 to about 20 percent by weight, based on weight of final foam, of antimony oxide;

(d) from about 1 to about 15 percent by weight, based on weight of final foam, of a polyhalogenated member



selected from the class consisting of polyhalogenated aliphatic diols and polyhalogenated aromatic compounds; and

(e) from 0 to about 15 percent by weight, based on weight of final foam, of alumina trihydrate; and

(f) when the amount of alumina trihydrate is zero, a chlorinated hydrocarbon polymer in an amount such that the resultant foam contains from about 2 to about 8 percent by weight of chlorine;

said core of flame retarded polyurethane foam being enclosed in a covering of flame retardant ticking; and

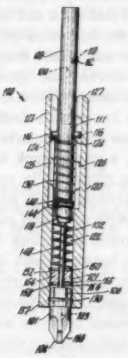
said box spring comprising a non-combustible frame.

4,092,753

COMBINATION DRILL AND SCREWDRIVER

Manfred E. Fuhrmann, 115 West St., Mamaroneck, N.Y. 10543

Filed Apr. 5, 1976, Ser. No. 673,990
Int. Cl.[2] B25F *3/00*
U.S. Cl. 7—158 **2 Claims**



1. A combination screwdriver and drill tool comprising a hollow cylindrical outer sleeve having an upper end and a lower end, the internal walls of said outer sleeve having first longitudinal slots formed along a substantial length thereof and located diametrically opposed to each other, the internal diameter of said outer sleeve being less at the upper end thereof than that of the balance of said outer sleeve, a lateral downwardly facing shoulder formed at the point where said lesser and

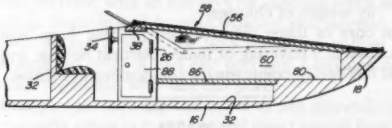
greater diameters of said outer sleeve join, a second slot formed in the outer walls of the upper end of said outer sleeve and extending completely therethrough and being oriented at a right angle to said first slots, a cylindrical shaft having a central passage therein and having a proximal end and a distal end located longitudinally within said outer sleeve, first spring means disposed on said shaft and engaging said downwardly facing shoulder to urge the distal end of said shaft extending to just below the central portion of said outer sleeve, a cutting drill bit extending through said central passage of said shaft and the length of said outer sleeve, said shaft and cutting drill bit being fixedly engaged with one another, second spring means urging said outer sleeve downwardly with respect to said cutting drill bit and shaft, transverse pin means extending from said shaft, engaging said first longitudinal slots in said outer sleeve, the base of said slots serving as a stop means engageable with said pins to limit downward movement of said shaft and cutting drill bit with respect to said outer sleeve, guide means in the lower portion of said outer sleeve for said cutting drill bit, and changeable screwdriver bit means secured in the lower portion of said outer sleeve and locked against rotation relative to said outer sleeve, and a longitudinal central passage within said changeable screwdriver bit means adaptable to permit said cutting drill bit to pass therethrough.

4,092,754

BOAT INTERIOR AND CABIN DESIGN

John V. Yost, 2233 Riverside Dr., Trenton, Mich. 48183

Filed Mar. 7, 1977, Ser. No. 775,058
Int. Cl.[2] B63B *17/00*
U.S. Cl. 9—1.1 9 Claims



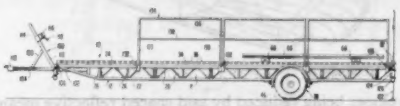
1. A boat including a hull defining longitudinal upstanding opposite sides interconnected by a bottom extending between lower marginal edges of said sides and by a bow structure at their forward ends and a transom structure at their rear ends, a pair of spaced apart midship opposite side compartments immediately inwardly of said sides and defining a center longitudinal aisle therebetween, said sides terminating upwardly in generally horizontal gunwales, said compartments projecting appreciably upwardly above said gunwales and including forward upper portions inclined forwardly and downwardly toward said gunwales, a lower walk deck extending longitudinally of said hull between said compartments and appreciably forwardly of the latter, a raised deck above and below said walk deck and gunwales, respectively, extending between said sides forwardly of said compartments and forwardly from the latter toward said bow structure, said raised deck including a rearwardly opening vertical extending recess formed therein opening into said aisle between said compartments and in vertical registry with the forward portion of said walk deck extending forwardly of said compartments, the portion of the interior of said hull disposed between said compartments and said bow and between said opposite sides defining a forward cockpit, and a cover removably secured over said cockpit including a top panel and depending opposite side panels, said top panel including front and rear marginal edges, said side panels including forwardly and downwardly inclined rear marginal edges extending downwardly from adjacent ends of said rear marginal edge of said top panel, said inclined marginal edges being anchored relative to the corresponding portions of said forwardly and downwardly inclined compartment upper portions, said side panels including lower marginal portions anchored relative to the corresponding gunwale portions forward of said compartments and the forward marginal edges of said top panel being anchored relative to said bow structure.

4,092,755

HIGHLY VERSATILE DOCK TRAILER

Gary W. Hughes, 33 Vista Dr., Little Rock, Ark. 72204

Filed Mar. 18, 1977, Ser. No. 779,109
Int. Cl.[2] B63C *13/00*
U.S. Cl. 9—1.2 6 Claims



1. An improved, combined trailer and dock unit, said unit comprising an elongated rectangular, open chassis frame, flotation members fixedly mounted within said frame opening and protected by said chassis frame, wood decking fixed to the upper surface of the chassis frame and overlying said flotation members, said chassis frame including horizontal bottom beams on each side thereof, a drop axle wheel assembly for detachably mounting to said frame, each wheel assembly comprising a pair of elongated slider bars, spring members shackled to said slider bars and depending therefrom, wheels mounted to the spring members and means for detachably mounting said slider bars to the bottom of said chassis frame side beams at longitudinally adjustable positions, demountable bunks carried by said chassis frame and projecting above said deck for guiding a boat longitudinally therebetween during loading of the boat onto said unit, at least one roller means demountably carried by said chassis frame adjacent the rear end of the unit and projecting above the deck for contact with the boat keel during movement of the boat longitudinally into overlying position with respect to the unit deck, a tow bar means, means for mounting said tow bar means to the front end of said chassis frame at the center thereof, winch means mounted to said towbar means for winching the boat over said roller means and onto said bunks, vertically adjustable anchor bars mounted to at least the rear corners of said chassis frame for vertical movement relative to said chassis frame for jacketing the rear of said trailer-dock unit above the water level to permit the unit to act as a fixed dock within the water, subsequent to unloading of a boat therefrom, means for removably mounting a winch including a winch line adjacent to each of said vertically adjustable anchor bars, and pulleys fixed to said chassis frame adjacent the vertically adjustable anchor bars; whereby, by attachment of the end of a winch line to the upper end of the vertical anchor bar and by leading said line through said pulley, operating said winch forcibly drives the vertically adjustable anchor bars vertically downward into the sea bottom to lift the rear end of said dock-trailer unit.

4,092,756

DIVER'S BUOYANT CADDY

Barry Robert Stier, P.O. Box 102, Ginowan, Okinawa, Japan

Filed Apr. 15, 1977, Ser. No. 787,987
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 1 Claim

1. A buoyant vessel which is adapted to a marine diver's use as a diver attachable caddy in the suspension, transport and storage of marine equipment, game and the like comprising:

A. a flexible bladder which is fluid impermeable, said bladder being elongated in a horizontal direction and streamlined longitudinally for facile movement under the water, primarily in horizontal directions, said bladder defining a skirt at its bottom which said skirt comprises a streamlined continuation of the bladder in a downward, vertical direction, said skirt forming inner and outer apertures at vertical ends thereof and defining an inflatable facemask connection between the bladder and the sea, whereby upon

application of outer aperture to the face of the diver his exhalant may inflate the bladder;

B. a flexible stringer which is secured interiorly to the skirt and shielded thereby, said stringer providing a connection for a restraint line, joining the diver to the vessel, per se.

4,092,757

APPARATUS FOR THE IDENTIFICATION OF SIZE NUMBERS OF RIGHT AND LEFT LASTS

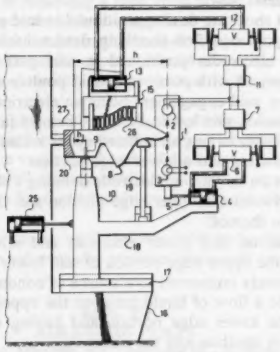
Ludvik Dokoupil; Oldrich Hrouda, both of Gottwaldov, and Josef Zila, Otrokovice, all of Czechoslovakia, assignors to Zavody presneho strojirenstvi, narodni podnik, Gottwaldov, Czechoslovakia

Filed May 13, 1977, Ser. No. 798,562

Claims priority, application Czechoslovakia, May 13, 1976, 3183/76

Int. Cl.[2] A43D *3/00*

U.S. Cl. 12—127 **5 Claims**



1. Apparatus for identifying the size numbers of right and left shoe lasts on a shoe making machine having a frame and shoe ironing devices, comprising a support for the heel part of a shoe last supported on the frame of the machine, the support having means cooperating with the heel part of the shoe last to locate the last with respect to the support, the heel part support having an extension, a support for the toe part of the shoe last slidingly supported on the extension for movement in a direction perpendicular to the longitudinal axis of the shoe last, a support for identification elements slidably mounted on said extension for movement in the direction of the longitudinal axis of the shoe last, a first power means for selectably sliding the support for the identification elements in reverse directions, the identification elements comprising two sets of light sources and cooperating photocells arranged side by side on the support for the identification elements and adapted to identify in the course of their movement the size number of a left or a right shoe last by the interruption of a light beam striking the photocell by the toe part of the shoe last, means to control the said first power means according to the response of one of said photocells, second power means fixedly mounted on the frame of the machine, means controlling the said second power means in response to said photocells, and form plates for adjustment of said ironing devices slidably supported on the frame of the machine for movement in reverse directions generally along the length of the shoe last, the second power means being connected with said form plates so as selectively to adjust the form plates in either direction generally longitudinally of the shoe last.

4,092,758

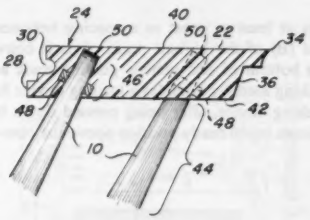
CAST POWER BRUSH

John P. Horton, Bernardsville, and Susan H. LeWand, Colonia, both of N.J., assignors to Newark Brush Company, Kenilworth, N.J.

Filed Aug. 14, 1975, Ser. No. 604,546

Int. Cl.[2] A46B *3/02, 3/16*

U.S. Cl. 15—180 **7 Claims**



1. In a rotary power driven high speed, heavy-duty municipal sweeping brush element having a working surface that is flat or disc shaped and provided with means for attaching the brush to a rotary heavy-duty source of power,

said brush element containing a multiplicity of bristles having medial bends therein formed into a plurality of tufts containing a plurality of bristles, each tuft being surrounded by a mechanical restraining means so that a bight is formed in each of the tufts above said restraining means and so that the major portion of the bristles extend below said restraining means to perform the sweeping function, and a back for said brush and a positioning means for said tufts comprising a body of a fiberglass filled and reinforced substantially inflexible high impact thermoset polyester resin having a notched izod impact strength greater than 2 foot-pounds per inch and a Shore D hardness greater than 50 cast around said tufts so that said bight is embedded in said resin with its upper end closer to the top surface of said brush back than to the bottom surface thereof and with said restraining means being closer to the bottom surface of said back than to the top surface thereof and at least substantially completely embedded in the body of said resin.

4,092,759

COUNTING MECHANISM FOR A MOTOR VEHICLE WASHING PLANT

Gebhard Weigele, Am Schönblick 1a, 8901 Tafertingen, Germany

Filed Jan. 26, 1977, Ser. No. 762,748

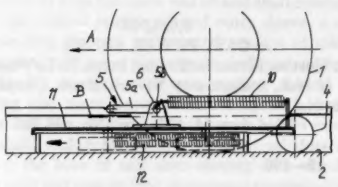
Claims priority, application Germany, Feb. 23, 1976, 7605361

Int. Cl.[2] B61L *1/16*; B60S *3/04*

U.S. Cl. 15—257 **5 Claims**

1. In a counting mechanism for a motor vehicle washing plant having a vehicle guiding track, comprising a vertically movable switching member adapted to be contacted by and operated by the wheels on one side of a vehicle, said switching member extending transversely with respect to the direction of movement of said vehicle and in the path of movement of said wheels on said one spacing (b) of said vehicle, a stroke counter connected to said switching member and a conveyor device for moving said vehicle through said washing plant, said conveyor device having plural spaced conveyor rollers mounted

on an endless tension member and moved in said vehicle guiding track, the path of which corresponds to said path of movement of said wheels on said one side of said vehicle, the improvement comprising wherein said switching member is arranged in said path of movement of said conveyor rollers, wherein the limits of vertical movability of said switching



member is at least as great as a spacing between a path of movement (B) of the highest point of each conveyor roller above the bottom of said vehicle guiding track and wherein said switching member includes a loading device for returning said switching device, after being pressed down by a vehicle wheel, into an initial ready position above the conveyor roller.

4,092,760

TRAVELLING SUPPORT FOR SCAFFOLDING

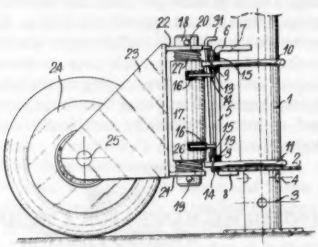
Henri Loewe, Paris, France, assignor to Societe Francaise des Echafaudages Self-Lock, Aulnay-sous-Bois, France

Filed Sep. 1, 1976, Ser. No. 719,370

Claims priority, application France, Sep. 12, 1975, 75 28073

Int. Cl.² B60B *33/02*

U.S. Cl. 16—35 R **7 Claims**



1. Travelling support for a scaffolding upright, said support comprising:

a holder;

means for releasably locking said holder in a multi-directionable way on the scaffolding upright;

a shaft fixedly mounted on said holder;

a spindle placed in said shaft; and

a fork for supporting a wheel hingedly mounted on said spindle, the means for releasably locking the holder on the upright of the scaffolding comprising at least one wedge shaped key-bolt bearing against said holder and one U-shaped belt having ends passing through the bottom portion of said holder and cooperating therewith to form a stop for said wedge shaped key-bolt.

4,092,761

METHOD AND APPARATUS FOR ELECTRONICALLY RELAXING POULTRY

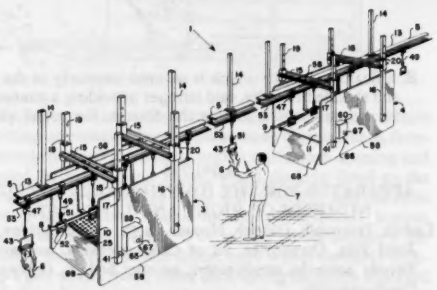
Garland G. McWhirter, deceased, late of Kansas City, Mo. (by Nell J. McWhirter, surviving spouse), assignor to Jerry McWhirter, Kansas City, Mo.

Continuation of Ser. No. 429,867, Jan. 2, 1974, abandoned. This application Jan. 2, 1991, Ser. No. 646,357

The portion of the term of this patent subsequent to Dec. 31, 1976, has been disclaimed.

Int. Cl.² A22B *3/00*

U.S. Cl. 17—1 E **11 Claims**



1. Apparatus for electrically shocking poultry in a poultry processing operation, said apparatus comprising:

(a) a poultry conveyor having a plurality of poultry supporting shackles spaced therealong and movable in a defined path, said shackles engaging legs of poultry to support same head down;

(b) a first shocking device positioned in said path along said conveyor, said first shocking device having upper and lower electrodes positioned in said path for electrical engagement with portions of said poultry as same moves thereby, said engagement being an electrical circuit making contact, said lower electrode being a laterally extending member having an inclined upper surface and an upper edge portion and a lower edge portion

(c) means on said lower electrode defining a channel extending between the upper edge portion and the lower edge portion thereof;

(d) means on said lower electrode and means extending along the upper edge portion of said lower electrode and operatively connected to a source of conductive liquid to provide a flow of liquid between the upper edge portion and the lower edge portion and having a substantially uniform depth across the channel;

(e) means including portions defining a liquid collecting channel extending along the lower edge portion of said lower electrode for collecting used liquid and poultry waste across the width of the channel for disposal of the liquid and waste;

(f) a jugulating area positioned in said path along said conveyor and spaced from said upper edge portion of said lower electrode;

(g) a second shocking device positioned in said path along said conveyor and having said jugulating area between said first and second shocking devices, said second shocking device having upper and lower electrodes positioned in said path for engagement with portions of said poultry as same moves thereby, said engagement being an electrical circuit making contact; and

(h) means electrically connected to said upper and lower electrodes of said first and second shocking devices for applying a first electrical potential difference to said upper and lower electrodes of said first shocking device and a second electrical potential difference to said upper and lower electrodes of said second shocking device whereby poultry moving along said path complete an electrical

circuit between the electrodes in each of said first and second shocking devices and the poultry is shocked a first time in said first shocking device before moving into the jugulating area to stun and maintain the poultry in a stunned condition and the poultry is shocked a second time in said second shocking device with a lesser electrical potential difference after jugulation is performed on the poultry, said second shock being of a voltage to facilitate bleeding of the poultry.

4,092,762

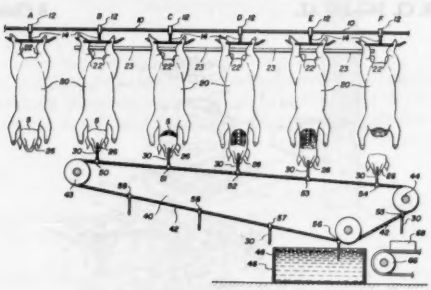
HOG HEAD REMOVAL METHOD

Edward Ochylski, 9155 S. Pleasant, Chicago, Ill. 60620

Division of Ser. No. 477,781, Jun. 10, 1974, Pat. No. 3,990,126. This application Apr. 12, 1976, Ser. No. 675,704

Int. Cl.[2] A22B *3/00*

U.S. Cl. 17—45 **11 Claims**



1. A method of removing a head from a hog carcass which has been stuck which method comprises:

suspending said carcass in the head-down position;

marking the skin of the carcass around the neck;

engaging a hook in the stick wound or in the jaw of said carcass;

thereafter applying a substantially longitudinal force to said carcass through said hook, wherein said longitudinal force is offset from vertical, whereby the carcass is positioned in a "bellydown" attitude while the force is applied, and whereby the head is rotated upwardly about a horizontal axis; and

continuing said force until the atlas joint is disengaged and said head is substantially removed from said carcass.

4,092,763

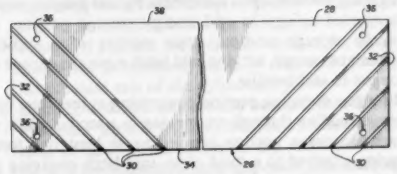
AIR GUIDE PLATE

Thomas C. Poore, Mauldin, S.C., assignor to J.P. Stevens & Co., Inc., New York, N.Y.

Continuation of Ser. No. 728,655, Oct. 1, 1976, abandoned. This application Jul. 12, 1977, Ser. No. 814,824

Int. Cl.[2] D01G *15/34, 15/74*

U.S. Cl. 19—98 **15 Claims**



1. A card machine air guide plate comprising a surface having a plurality of grooves substantially adjacent a pair of opposed lateral edges of said plate, each of said grooves forming an angle relative to said lateral edges for directing air flow across said surface from each of said opposed lateral edges towards the portion of said surface between said opposed lateral edges.

4,092,764

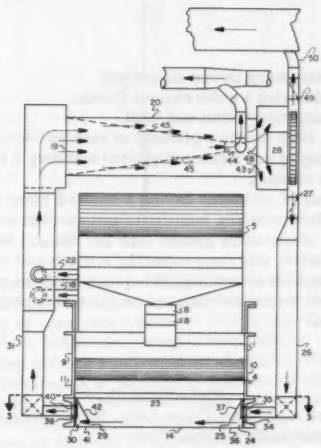
CLEANING OF TEXTILE CARDING MACHINES INCLUDING AN AIR RECIRCULATING SYSTEM

Arthur E. Thomas, and E. Alan Pace, both of Winston-Salem, N.C., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Dec. 3, 1976, Ser. No. 747,138

Int. Cl.[2] D01G *15/76*

U.S. Cl. 19—107 **23 Claims**



1. An apparatus for removing waste and trash from a carding machine including a supporting chassis set upon a carding room floor, the chassis having side walls which are parallel to the flow of fiber through the machine and end walls to define an enclosed bottom region in the machine beneath the carding components, comprising:

a. a first means attached to the machine to provide a flow of cleared air under positive pressure into the bottom region;

b. a pressure plenum mounted to the machine, said pressure plenum connected in communication with said first means to receive the flow of air under positive pressure and having an emitting orifice to emit the pressurized air into the bottom region;

c. a second means mounted to the machine to draw under negative pressure a flow of air entraining waste and trash from the bottom region;

d. a suction plenum connected to said second means, mounted to the machine and having a receiving orifice formed spaced from and opposite the emitting orifice through which is drawn a flow from the emitting orifice after the flow has crossed the floor and entrained waste and trash;

e. a waste concentrating means mounted to receive a flow from said suction plenum and separate this flow between a large volumetric flow of air clear of entrained waste and trash and a small volumetric flow of air in which the waste and trash is concentrated; and

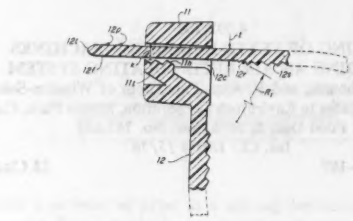
f. a recirculating means delivering a part of the large portion of air to said first means so that this air is recirculated as a component of the flow provided by said first means.

4,092,765

MINIATURIZED HARNESSING DEVICE

Arthur W. Joyce, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 657,513, Feb. 12, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,760
Int. Cl.[2] B65D *63/10*
U.S. Cl. 24—16 PB 4 Claims



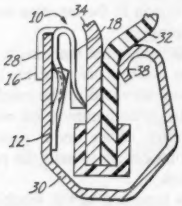
1. A harnessing device comprising
a head having a guide channel therein,
a locking tang within said head,
and a strap having a plurality of members for sequentially engaging said locking tang when said strap is inserted into said channel,
the end of said strap having a serrated ramp in an outer surface extending from one of said members over an interval of curvature greater than the distance between said members, said ramp extending towards said head on said strap from an end thereof having a thickness substantially equal to the unobstructed height of the channel in said head.

4,092,766

RETAINER CLIPS

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 492,680, Jul. 29, 1974, abandoned. This application Jul. 17, 1975, Ser. No. 596,815
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—73 MF 6 Claims



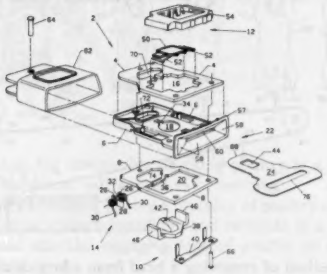
1. A sheet metal clip adapted for assembly on one flange of a U-shaped channel member for securing the margin of one or more workpieces in the space between the flanges of the channel member, the clip comprising:
an elongated body portion having along its upper edge a bight,
from which there downwardly extends on one side a transversely resilient suspension tab,
and downwardly on the opposite side there extends at least a pair of spaced resilient legs angularly related to the body portion and extending outwardly therefrom when unconfined,
a pair of prongs, located one on each side of said tab and projecting from said body portion toward said tab to define a space between said tab and said prongs for receiving the one flange of the channel in gripping engagement therebetween,
each of said legs being biased toward the opposite flange of said channel from said one flange when said clip is mounted on said channel, and extending from said body portion toward the opposite flange to define a space therebetween for receiving the one or more workpieces in gripping engagement therebetween,
and a prong disposed on each of said legs directed inwardly of said channel to retain the one or more workpieces in the so defined space in the channel.

4,092,767

LAMINATED BUCKLE WITH NO FALSE LATCH

Surendra D. Narayan, Warren, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 1, 1976, Ser. No. 662,990
Int. Cl.[2] A44B *11/26*
U.S. Cl. 24—230 AL 8 Claims



1. A buckle comprising:
a plurality of plates secured together, each of said plates having a cavity in the central portion thereof, said cavities being in substantial alignment with one another; at least one of said plates including guide means extending from an exterior forward end of said plate to its cavity for guiding a tongue into the buckle;
movable latch means for engaging the tongue, a portion of said latch means extending in and movable within said cavity of at least one of said plates;
manually operable actuation means for actuating said latch means, a portion of said actuation means extending in and movable in said cavity of at least one of said plates; and
a unitary biasing means disposed in said buckle near the fully inserted position of said tongue for moving said latch means into engagement with said tongue when said tongue is substantially fully inserted into said buckle and for ejecting said tongue upon movement of said latch means by said actuation means, said buckle offering low resistace to the insertion of said tongue until said tongue nears its fully inserted position in said buckle, said biasing means having a tongue engaging portion, an energy storage portion and a latch engaging portion; said tongue engaging portion, upon movement by said tongue, causing storage of energy in said energy storage portion, said energy storage portion, upon storage of a sufficient amount of energy, moving said latch means to engage said tongue in said buckle;
said tongue engaging portion comprising at least one upper arm extending through an opening in a second plate; said energy storage portion comprising at least one torsion spring attached to a third plate, said latch engaging portion comprising at least one lower arm, said lower arm extending under said latch means; said tongue, upon nearing its fully inserted position in said buckle, pushing said upper arm in a first direction substantially parallel to movement of said tongue as said tongue enters said buckle, said movement of said upper arm in said first direction

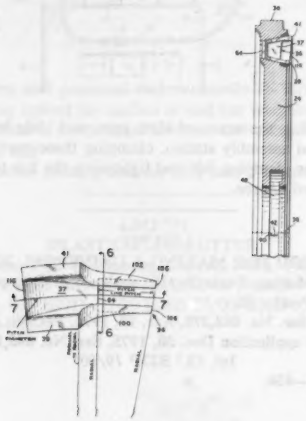
developing tension in said torsion spring, said spring raising said lower arm and said latch means when sufficient tension develops in said spring.

4,092,768

METHOD FOR MAKING A DIAPHRAGM WITH CAST NOZZLE BLOCKS

William W. Browning, and Donald J. Legacy, both of Wellsville, N.Y., assignors to Turbodyne Corporation (Steam Turbine Division), Wellsville, N.Y.

Division of Ser. No. 631,891, Nov. 14, 1975, Pat. No. 4,025,229. This application May 19, 1976, Ser. No. 687,923
Int. Cl.[2] B23P *15/04*
U.S. Cl. 29—156.8 R 5 Claims



1. A method for making a turbine diaphragm assembly wherein the cylindrical plate portion of the diaphragm assembly becomes the fixture for making the same which comprises the steps of:

a. forming and shaping in the front face of the cylindrical plate of the diaphragm assembly an arcuate generally V-shaped nozzle block mounting groove so that the respective inner and outer side surfaces of the arcuate nozzle block mounting groove have a predetermined slope relative the longitudinal axis of the cylindrical plate,

b. investement casting a plurality of substantially identically shaped and sized integral mounting blocks each having a nozzle blade of predetermined profile extending between an inner shroud segment and an outer shroud segment respectively formed to interfit with the inner shroud segment and outer shroud segment of any other of the nozzle blocks, and each of said nozzle blocks having an inner and outer surface which slopes in corresponding degree to the slope of the side surfaces of the arcuate nozzle blade mounting grooves,

c. disposing an arcuate array of said nozzle blocks in said groove in interfitted side by side relationship so that in assembled position the respective exit edges of the nozzle blades are substantially radially disposed relative to the longitudinal axis of the cylindrical plate,

d. bonding said inner surface and outer surface of the respective inner shroud segment and outer shroud segment of each of said nozzle blocks to the mating and matching slope of the respective inner and outer side surfaces of said nozzle block mounting groove,

e. removing material from the back face of said cylindrical plate in alignment with said nozzle block mounting groove to open a plurality of fluid flow passages through said cylindrical plate as defined by the nozzle blades on adjacent nozzle blocks,

f. electron beam welding the entrance end of said nozzle blocks to the front face of the cylindrical plate, and

g. finish machining the cylindrical plate and nozzle blocks to provide the completed diaphragm assembly.

4,092,769

FIBER BUNDLE ENCAPSULATING APPARATUS

Thomas David Dickson, Jr., San Jose, and Jeremy Corwin Wright, Palo Alto, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Apr. 14, 1976, Ser. No. 676,752
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—234 4 Claims

1. An apparatus for encapsulating a bundle of fibers aligned generally parallel to each other axially within an elastomeric tube having an unexpanded diameter smaller than the normal diameter of the bundle comprising in combination:

(a) a casing defining a tubular inner channel of diameter at least about equal to the normal diameter of the bundle, said casing being openable to expose said channel so that the elastomeric tube may be placed therein;

(b) a nipple at each end of the channel onto which the respective ends of the elastomeric tube are adapted to be sealingly placed;

(c) reversible pressurizing means connected to the bore of one of the nipples for generating sufficient pressure within the tube to temporarily expand the segment of the elastomeric tube between the nipples radially outwardly against the inner surface of the casing that defines the channel;

(d) means for drawing the bundle of fibers through one of the nipples into the radially expanded tube while maintaining said pressure;

(e) a removable tubular member adapted to receive and hold the bundle before the latter is drawn into the tube;

(f) means for sealing one end of the tubular member against the exterior end of said one of the nipples with the bores of the tubular member and said one of the nipples aligned and open to each other; and

(g) means for sealing by closing the other end of the tubular member.

4,092,770

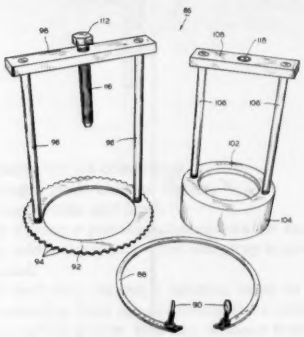
CLUTCH ASSEMBLY-DISASSEMBLY TOOL

Gerald L. Polashak, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 29, 1977, Ser. No. 811,332
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—263 7 Claims

1. A clutch assembly-disassembly tool in combination with a fluid-actuated type clutch having an internally splined drum affixed to a first rotatable transmission member, an externally splined hub affixed to a second rotatable transmission member, and a plurality of interleaved friction plates splined alternately to said hub and drum wherein said friction plates are confined

between an annular end plate located via a retainer ring in a retainer ring groove in the splined inner peripheral surface of said drum and a fluid pressure actuated piston which serves to press said friction plates together thereby connecting said hub and drum for conjoint rotation, said piston being biased in a direction away from said friction plates via a piston return spring confined between said piston and an annular spring retainer cup secured against axial movement via a snap ring located in a peripheral snap ring groove of said first rotatable transmission member, wherein said assembly-disassembly tool is utilized for compressing said piston return spring to permit the ready insertion or removal of said snap ring during the absence of said end plate and friction plates, said assembly-disassembly tool comprising:



a. an outer annular member being adapted to fit within said internally splined drum;
b. an externally expanding split retainer ring adapted to fit into said retainer ring groove and function to restrain said outer annular member against axial movement out of said drum;
c. an inner annular member fitting within said outer annular member and seating on said annular spring retainer cup; and
d. means for displacing said inner annular member axially inwardly within said drum, relative to said outer annular member, thereby compressing and axially displacing said spring so as to permit ready removal or insertion of said snap ring relative to said snap ring groove.

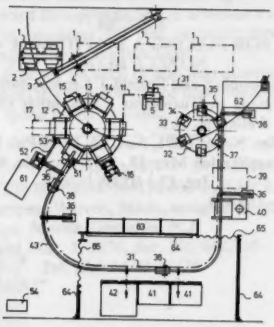
4,092,771

PROCESS AND APPARATUS FOR RENEWING SLIDING GATE VALVE UNITS FOR CASTING LADLES

Bernhard Tinnes, Zollikerberg, and Franz Ruckstuhl, Schwerzenbach, both of Switzerland, assignors to Metacon AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 580,516, May 23, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,692
Claims priority, application Switzerland, Mar. 27, 1974, 7215/74
Int. Cl.[2] B23P *7/00, 19/04, 25/00*
U.S. Cl. 29—401 F **8 Claims**

7. A method for renewing sliding gate valve units for casting ladles, comprising:
disassembling each unit into its slide housing, slide part and clamping lid;
shunting the slide housings and slide parts into two separate loops of work stations which rejoin at a final assembly station;
in the first of loops, clearing out worn-out refractory elements from the slide parts, setting new refractory elements in mortar in the slide parts, baking the slide parts to set the mortar and transferring the renewed slide parts to the final assembly station;
in the second of the loops, clearing out worn-out refractory bed stones from the slide housings, setting new refractory bed stones in mortar, heating the slide housings to set the mortar and transferring the renewed slide housings to the final assembly station; and



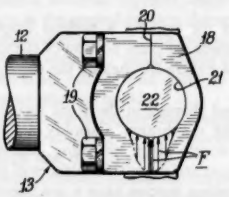
reassembling the renewed slide parts and slide housings at the final assembly station, clamping these parts together with the clamping lids and tightening the lids to a predetermined degree.

4,092,772

METHOD FOR MAKING A UNIVERSAL JOINT

Rodger L. Moring, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 462,379, Apr. 19, 1974, Pat. No. 3,958,431. This application Dec. 30, 1975, Ser. No. 645,149
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—434 **3 Claims**



1. A method for making a universal joint comprising the steps of
attaching an end cap to each support arm of a pair of yoke assemblies, at abutting bearing surfaces thereof,
machining and forming a cylindrical bore between each said end cap and support arm so that said bore intersects said bearing surfaces,
detaching a said end cap from each said support arm,
mounting a cylindrical bearing race on each journal of a journal cross,
closely fitting said cylindrical bearing race within each bore to maintain intimate bearing contact therebetween and
reattaching a said end cap to each support arm to retain a respective bearing race and journal thereon.

4,092,773

METHOD FOR FORMING A CLEVIS

Carroll F. Donahue, 1924 Russell, Dearborn, Mich. 48128

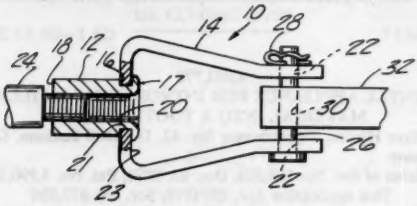
Division of Ser. No. 611,128, Sep. 8, 1975, Pat. No. 4,025,208. This application Jan. 3, 1977, Ser. No. 756,013
Int. Cl.[2] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—512 **2 Claims**

1. A method of forming a clevis comprising a U-member and a shank with ends proximal and distal to said U-member, said

shank having an annular shoulder spaced from its proximal end, said method comprising the steps of:

(a) forming a hole in a metal bar;

(b) inserting said proximal end of said shank through said hole so that said shoulder abuts against one side of the metal bar;



(c) rolling said proximal end outwardly to form a flange pressing against the surface of said bar whereby a portion of said bar is sandwiched between said shoulder and said flange; and

(d) thereafter forming said bar into said U-member.

4,092,774

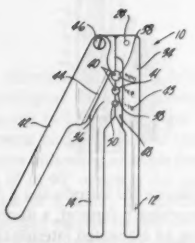
PLASTIC TUBE CUTTER

Homer Watts, 8725 Continental, Warren, Mich. 48089

Filed Jan. 21, 1977, Ser. No. 761,223

Int. Cl.² B23D *21/06;* B26B *27/00;* B26D *3/16*

U.S. Cl. 30—92 **5 Claims**



1. A device for cutting cylindrical plastic tubing comprising:

a first elongated handle member;

a second elongated handle member;

means for pivotally securing one end of said first handle member to one end of said second handle member so that said handle members are movable between an open and closed position;

jaw means formed on each of said handle members for clampingly engaging said tubing of different and predetermined outside diameters when said handle members are in said closed position wherein said jaw means comprises a plurality of semicircular channels formed on each handle member, each channel on each handle member having a different radius and being spaced along said handle members so that upon closure of the handle members, said channels of a like radius on opposite handle members register with and face each other so that with tubing positioned between channels having a radius equal to one half the diameter of the last mentioned tubing said last mentioned channels clampingly engage and support substantially the entire outer periphery of said tubing when said handle members are in said closed position; and

a cutting blade pivotally secured to said first handle member and adapted to move from an outer pivotal position, across said jaw means generally perpendicular to longitudinal axis of said channels and to an inner pivotal position to thereby cut said tubing.

4,092,775

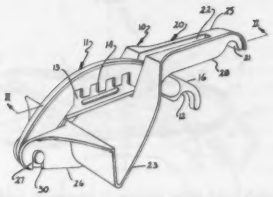
MANUAL WINDOW SHADE ROLLER CUT OFF KNIFE

Paul J. Erpenbeck, Grand Rapids, Mich., assignor to Breneman, Inc., Cincinnati, Ohio

Filed Mar. 1, 1976, Ser. No. 662,341

Int. Cl.² B23D *21/06;* B26B *27/00;* B26D *3/16*

U.S. Cl. 30—95 **6 Claims**



1. A manual shade cutter including:

an elongated cutting member having a first extremity and a second extremity, said second extremity including a first finger indentation having a concave surface adapted to be engaged by a finger, said cutting member adapted for cutting a shade;

an elongated supporting member having a bed shaped to support a rolled shade during cutting by said cutting member, said supporting member also having a first extremity and a second extremity, said second extremity including a second finger indentation having a concave surface adapted to be engaged by a finger;

a pivot means rotationally coupling said first extremity of said cutting member to said first extremity of said supporting member;

a blade coupled to said cutting member and having a cutting edge generally aligned with a plane through the longitudinal axis of said cutting member and facing said supporting member;

said supporting member having a slotted portion intermediate said second finger indentation and said bed through which said cutting member extends generally intermediate said first finger indentation and said blade, so that applying pressure to either of said finger indentations causes rotation of both said supporting member and said cutting member about a shade supported on said bed; and

resilient biasing means coupled between said cutting member and said supporting member for urging such members toward one another so that said rotation of said cutting and supporting members about The shade results in a cutting action about the periphery of the shade due to the urging by said biasing means of said blade against the shade and less cutting action occurs when finger pressure is applied to said first finger indentation than when applied to said second finger indentation.

4,092,776

CUTTING TOOL

William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 16, 1977, Ser. No. 861,291

Int. Cl.² B26B *13/18*

U.S. Cl. 30—253 **8 Claims**

1. A cutting tool, comprising:

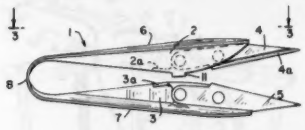
(a) one-piece plastic tongs having a substantially U-shaped torsion spring portion and two integral leg portions extending therefrom and terminating in free ends, each said leg portion having a cutting blade mounting surface adjacent said free end;

(b) a pair of cooperating, flat, cutting blade members

mounted on said cutting blade mounting surfaces and having a cutting surface projecting beyond said free ends, said cutting blade members being oppositely angularly disposed along their length and width with respect to one another as to provide crossover and clearance of said cutting surfaces for a cutting operation; and

(c) disengageable stop means operable, when engaged, to limit relative movement of said legs;

(d) said tongs having a normal, fully open position in which said stop means is disengaged and said leg portions are urged by said torsion spring portion to their furthest separation, and second and third positions of lesser separation



in which said stop means is engaged and said legs are in side-by-side relationship with said mounting surfaces facing one another, the cutting surfaces being exposed for cutting in said second position and not exposed in said third position, the blade members being operable to perform said cutting operation as the legs are moved together from said second position to said third position; and

(e) said torsion spring portion being operable to apply torsion forces to said legs to urge said blade members together in cutting relationship as the cutting operation is performed and to return said tongs from said third position to said second position, said stop means, when engaged, stopping the returning legs at said second position.

4,092,777

CUTTING-OUT MACHINE FOR FLAT MATERIAL

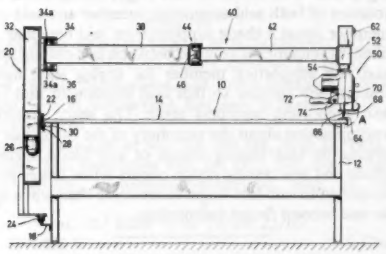
Rolf Jung, Waiblingen, Germany, assignor to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik, Waiblingen, Germany

Filed Mar. 10, 1977, Ser. No. 776,355

Claims priority, application Germany, Jan. 26, 1977, 2703066; Mar. 16, 1976, 7608012[U]

Int. Cl.[2] B26B *7/00*

U.S. Cl. 30—273 **9 Claims**



1. A cutting-out machine for flat material, especially a cloth cutting machine, comprising in combination:

a support means for the flat material;

guide means mounted lengthwise of that support means;

a beam positioned above that support means and pivotable around a vertical axis being mounted on a carriage which is movable along the guide means lengthwise of that support means, that beam having at least two arms which are interconnected by a joint having a vertical joint axis, a first one of that arms being pivotable around the vertical beam axis and a second one of that arms having a free end opposite to its end interconnected with that first arm;

a cutting mechanism mounted at the free end of that second arm and being pivotable around a vertical axis being substantially coincident with a cutting edge of a cutter element of that cutting mechanism;

the length of that first and second arms being such that the entire length of that completely extended beam is substantially equal to the width of that support means in a direction perpendicular with respect to that guide means.

4,092,778

DENTAL APPLIANCE FOR INTRODUCING A FILLER MATERIAL INTO A TOOTH CAVITY

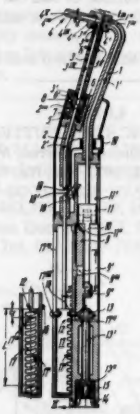
Rudiger Hirdes, Tippelsberger Str. 42, D - 4630 Bochum, Germany

Division of Ser. No. 535,312, Dec. 23, 1974, Pat. No. 3,990,152. This application Apr. 19, 1976, Ser. No. 677,886

Claims priority, application Germany, Dec. 24, 1973, 2364547

Int. Cl.[2] A61C *3/10*

U.S. Cl. 32—60 **7 Claims**



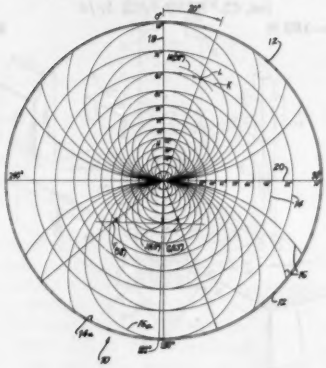
1. A dental appliance for introducing a filler material into a tooth cavity, comprising a support; a discharge nipple on said support and having an elongated interior channel formed with an inlet and an outlet; first means forming a first passage having an open end; second means forming a second passage which communicates with said inlet; a replaceable magazine on said support and having an elongated chamber for a quantity of said filler material, said chamber communicating with said open end and with said channel in direction transverse to the elongation of the channel; a first expelling element reciprocable in said first passage and chamber for expelling a portion of said filler material and charging it into said channel; a second expelling element reciprocable in said second passage and channel for expelling said portion through said outlet; and a single mechanical drive means for effecting coordinated reciprocation of both of said expelling elements, said drive means including a crank drive having a crank connected to said second expelling element by a crank rod and a cross-head to thereby reciprocate said second expelling element, and a rack drive having a rack connected to said first expelling element and driven by said crank to thereby reciprocate said first expelling element coordinately with said second expelling element, said crank being configurated as a bevel gear projecting beyond the path of travel of a pin on said crank rod and meshing with a bevel pinion which has a shaft aligned with the axis of said cross-head and said second expelling element, said shaft having a trailing end portion provided with a socket coupling and with a slip-clutch which is interposed between said coupling and said bevel pinion.

4,092,779

DEVICE FOR DETERMINING ANGLE RELATIONSHIPS OF OR BETWEEN PLANES

Bozidar M Stokic, 1/12 Woodstock Street, St. Kilda, Australia (3182)

Filed Jan. 25, 1977, Ser. No. 762,291
Claims priority, application Australia, Jan. 30, 1976, PC4676
Int. Cl.[2] G01C *21/20*
U.S. Cl. 33—1 SD 7 Claims



1. A device for determining angle relationships between planes, such as in geological structures, comprising:

a disc member having two opposed planar surfaces;

a family of concentric circles on one of said planar surfaces each of said circles indicating an angle from at least part of the range from 0° to 90° which is the complement of the half angle of one of a family of notional right circular cones of equal height, each of said circles being the base of the cone of which the angle it indicates is the complement of the half angle;

a family of curved lines on one of said planar surfaces, each of the curved lines of said family passing through a common point coincident with the common center of said family of concentric circles and each of said curved lines being a portion of a circle each of which has its center on one common line extending radially from the common point;

each of said curved lines indicating an angle from at least part of the range from 0° to 90° which is the complement of the half angle of one of a family of notional right circular cones of equal height, each cone having a base with a radius equal to the diameter of the curved line which indicates the complement of the half angle for that cone;

a base member on which said disc member is rotatably mounted, said base member having thereon a horizontal bearing degree scale;

a ruler member extending across said disc member having a ruler edge thereon; and

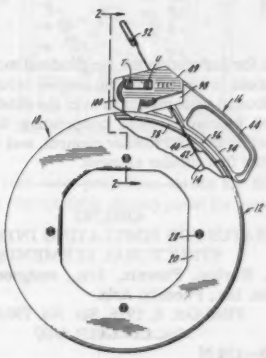
means for mounting said ruler member on said base member, said mounting means including means for rotating said ruler member with respect to said planar surfaces of said disc member and said base member and said mounting means including means for lateral movement of said ruler member with respect to said planar surfaces of said disc member and said base member.

4,092,780

ELECTRICIAN'S FISH TAPE

Thomas E. Trethewey, and Peter M. Wells, Jr., both of Sycamore, Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 648,149, Jan. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 603,324, Aug. 11, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,898
Int. Cl.[2] G01B *3/10*
U.S. Cl. 33—139 12 Claims



1. For use in an electrical fish tape reel assembly in which a reel includes a generally annular tape-receiving chamber peripherally bounded by a pair of axially opposed lips adapted to separate to permit winding and unwinding of a fish tape in the chamber, the improvement comprising a tape winder adapted to be mounted between the lips so as to project outside of the reel and constructed to be moved peripherally around the reel between the lips, a tape passage through the tape winder for passage of the tape therethrough, a counter chamber in the tape winder, a handle on the tape winder, the tape passage being directed outwardly through the winder at an oblique angle to the radius of the reel and extending through the counter chamber for passage of the tape therethrough, the tape passage including an inlet passage on the inside of the winder and an outlet passage on the outside thereof spaced from each other to provide an aligned rectilinear path for a free span of tape in the counter chamber, and a counter mechanism in the counter chamber mounted on one side of the tape passage including a rotary drive wheel in fixed position in the counter chamber, the radius of the drive wheel being greater than the distance between its axis and the rectilinear path for the free span of tape to provide a positive friction drive between the tape and the drive wheel so that the counter mechanism will indicate a linear measure for the tape fed to and from the reel.

4,092,781

CHAIN ELONGATION GAUGE

Eugene H. Blake, 874 Hollister St., Space 21-B, San Diego, Calif. 92154

Filed Apr. 1, 1977, Ser. No. 783,613
Int. Cl.[2] G01B *5/00*
U.S. Cl. 33—143 J 9 Claims

1. A measuring apparatus which comprises: a first tubular element;

a second tubular element slidingly nested into the first tubular element;

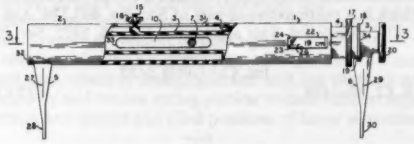
resilient means for forcing the tubular elements toward their maximum combined elongation;

means for limiting the longitudinal motion and for preventing the rotation of the second tubular element in relation to the first;

cylindrical indicator means for measuring the longitudinal

travel of the second tubular element in relation to the first comprising:

a third element slidingly inserted between the first and second tubular elements;



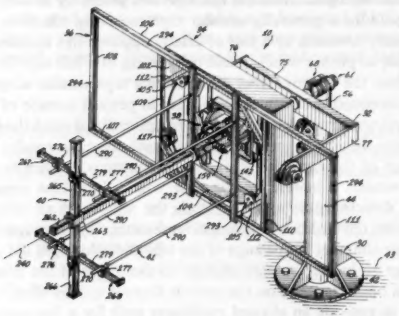
means for preventing the longitudinal motion of the third element in relation to the second tubular element; and helicoidal scale markings over the outside surface of the third tubular element cooperating with a reference point on the first tubular element, and a reference point on the first tubular element.

4,092,782

APPARATUS FOR SIMULATING INTERSECTING STRUCTURAL ELEMENTS

Charles L. Raybon, Phoenix, Ariz., assignor to Time Saver Industries, Inc., Phoenix, Ariz.

Filed Oct. 6, 1976, Ser. No. 730,030
Int. Cl.[2] G01B *3/00*
U.S. Cl. 33—174 N **50 Claims**



1. An apparatus for simulating the intersecting attitudes of an elongated primary member and an elongated secondary member for determining the configuration of those members at the intersection thereof, said apparatus comprising:

(a) primary member simulating means for simulating the attitude and at least a portion of the surface of the elongated primary member, said primary member simulating means including,

I. a frame of substantially open planar configuration,

II. means for supporting said planar frame in a horizontal plane, and

III. means supportingly positioned on said open planar frame for forming an arcuate surface of predetermined curvature with that arcuate surface simulating at least a portion of the surface of the elongated primary member when the primary member to be simulated is of a substantially circular cross sectional configuration,

(b) secondary member locating means mounted on said primary member simulating means for simulating the location and the attitude of the longitudinal axis of the elongated secondary member to be simulated;

(c) secondary member simulating means coupled to said secondary member locating means for simulating at least a portion of the surface of the elongated secondary member; and

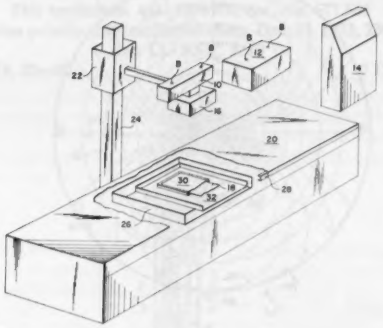
(d) pattern determining means mounted on said secondary member simulating means and in contact with the surface simulated thereby, said pattern determining means extending from said secondary member simulating means into contact with the surface simulated by said primary member simulating means for simulating the configurations of the simulated elongated primary and the simulated elongated secondary members at the intersection thereof.

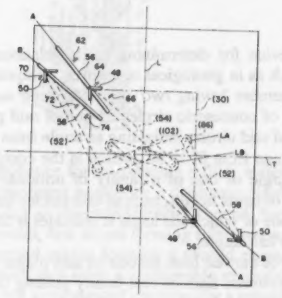
4,092,783

FLAT PLANE HOLDING FIXTURE

James J. Hodges, 1127 S. 6th St., Louisville, Ky. 40203

Filed Aug. 10, 1976, Ser. No. 713,324
Int. Cl.[2] B25B *5/02, 5/14*
U.S. Cl. 33—180 R **6 Claims**





1. A flat plane holding fixture for objects having diametrically opposed corners comprising:

(A) a base plate including a first pair of aligned slots, defining selective orientation of the object being held upon a longitudinal axis and a second pair of similarly aligned slots defining selective orientation of the object being held upon a transverse axis;

(B) pairs of opposed clamps slideably mounted within said pairs of aligned slots, so as to abut opposed corners of said object being held;

(C) linkage pivoted at the center point intersection of longitudinal and transverse axes of said object being held and interconnecting said clamps beneath said base, so as to govern constant equidistant disposition of said clamps with respect to said center point; and

(D) an electrically energized sensing circuit having:

(i) at least one sensor adjacent a slot in each said pair;

(ii) switch means closable, as one of said clamps abuts said sensor; and

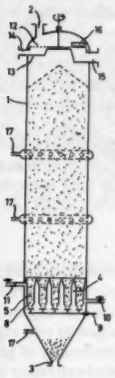
(iii) indicator means indicating closing of said switch and, thus, the size and orientation of said object.

4,092,784

PROCESS AND APPARATUS FOR DRYING AND HEATING NYLON GRANULES

Ernst Dietrich, Worms; Ernst Guenther, Ludwigshafen; Werner Hoerauf, Ludwigshafen; Ernst Kissel, Ludwigshafen; Hermann Linge, Carlsberg; Eckart Neumann, Frankenthal, and Eberhard Schaefer, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Jun. 23, 1976, Ser. No. 698,855
Claims priority, application Germany, Jul. 8, 1975, 2530304
Int. Cl.[2] F26B *3/14*
U.S. Cl. 34—13 10 Claims



1. In a process for drying and heating nylon granules, in which the granules flow downwards through a vertical zone, hot inert gas, which is free from molecular oxygen, is passed in countercurrent through the granules and the granules are then cooled and intermittently discharged in part-streams, the improvement which comprises feeding the granules wetted with water, or a suspension of the granules in water, into the top of said vertical zone, initially depositing the granules as a layer in the upper part of said vertical zone where the water is separated off and discharged, then transferring the layer of granules substantially free of water into the next-lower part of said vertical zone wherein the granules are allowed to flow under gravity downwards through the zone while passing an inert gas which is free from molecular oxygen in countercurrent upwards through the granules at from 70° to 200° C, with the proviso that the inert gas, before leaving the zone, is passed through the initially deposited layer of granules, thereafter dividing the granules into part-streams in the lower part of the vertical zone over the entire cross-section of the zone, and cooling these part-streams as the granules are passed intermittently, but simultaneously, over the entire cross-section of the zone, into a common discharge zone, with the proviso that the common discharge zone is only partially filled at all times during the process.

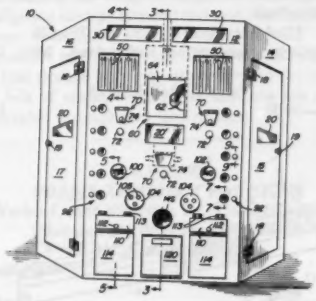
4,092,785

TEACHING AND DISPLAY APPARATUS

Edwin E. Forsman, P.O. Box 1524, Pocatello, Id. 83201

Filed Jan. 6, 1977, Ser. No. 760,134
Int. Cl.[2] G09B *1/02*
U.S. Cl. 35—1 8 Claims

1. A teaching and display apparatus comprising: first means for providing a portable support structure, second means associated with said first means for the display of various items for education and entertainment, and third means for providing associated audio messages along with the second means, the first means including a main support panel, at least one secondary support panel attachable to the main support panel by quick attach-detach means, and an access opening providing in said secondary support panel for an operator of the apparatus, the second means including at least one stage for puppet shows



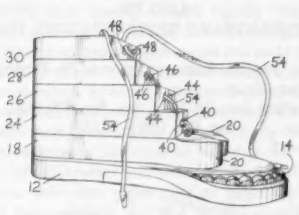
and the like, a rear view projection screen for films and the like, and at least one rotatable display panel for various objects.

4,092,786

EDUCATIONAL DEVICE

Susan Lynne Nirmaier Neese, 598 Angell St., Providence, R.I. 02906

Filed Apr. 19, 1976, Ser. No. 678,421
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—8 R 1 Claim



1. An educational device comprising a plurality of plates that are located one on top of the other in vertically stacked relation, the overall configuration of the stacked plates simulating a shoe, each of said plates being hingedly connected to an adjacent plate at an end thereof, wherein each of the plates is hingedly movable about a horizontal axis to selectively expose the interior surfaces of the plates as each is pivotally moved relative to the others, the bottommost of said plates defining a base and forming the sole of the simulated shoe, the forward portions of the plates above said base plate being located in stepped vertical relation to simulate the vamp of the shoe, each of the plates that define the vamp having pairs of spaced openings formed in the forward portion thereof through which a cord extends for simulating a shoestring, the plates located above the one in contact with the base plate having the openings formed in the forward edges thereof and in the uppermost face, wherein the cord is extendible therethrough for simulating the lacing of the shoestring when the plates are located in stacked relation.

4,092,787

APPARATUS FOR TEACHING THE EXECUTION OF A SKI TURN ON SKIS

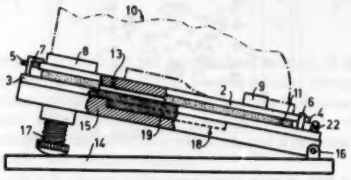
Adolf Kaempfen, 3, chemin du Connetable, Cologny pres, Geneva, Switzerland

Filed May 6, 1977, Ser. No. 794,626

Claims priority, application Switzerland, May 13, 1976, 6007/76

Int. Cl.[2] A63B 69/18

U.S. Cl. 35—29 R 13 Claims



1. Apparatus for teaching the technique of turning a ski, comprising left and right plates placed side by side in parallel relation to one another, each plate including means for supporting a shoe without capability of sliding, means supporting each plate for resilient lifting and lowering movements in accordance with shift of weight on the plate and for inclination about a longitudinal axis through the plate, and means responsive to the movement of said plates for producing a signal each time that one of the plates is unweighted and occupies a raised position while the other plate is weighted and simultaneously lowered and inclined about its longitudinal axis in the direction of the first plate.

4,092,788

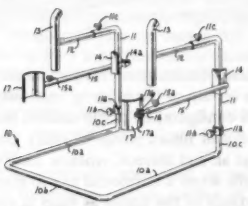
CARDIOPULMONARY RESUSCITATION TEACHING AID

Ellis Gowing, Topeka, Kans., assignor to St. Francis Hospital, Inc., Topeka, Kans.

Filed Jun. 23, 1977, Ser. No. 809,152

Int. Cl.[2] G09B 23/28

U.S. Cl. 35—17 9 Claims



1. A cardiopulmonary resuscitation training aid comprising:

a planar base;

vertical support means connected to said base at the periphery thereof and extended upwardly therefrom;

a pair of spaced apart, shoulder contact members connected to said vertical support means and projected outwardly therefrom over the plane of said base; and

a pair of spaced apart, elbow brace members connected to said vertical support means and projected outwardly therefrom over the plane of said base intermediate said shoulder contact members and said base.

4,092,789

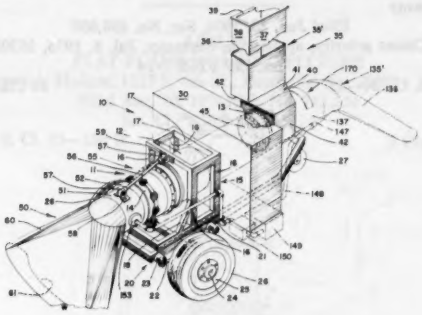
MOBILE DIRECTIONAL HIGH VELOCITY AIR MOVING APPARATUS

Jon Craig Arfons, 2999 Northview, Uniontown, Ohio 44685

Filed Dec. 20, 1976, Ser. No. 751,981

Int. Cl.[2] E01H 5/10

U.S. Cl. 37—12 17 Claims



1. Apparatus for directionally controlling the movement of high velocity air in relation to a work surface comprising, mobile support frame means, jet engine means having an elongate tubular housing attached to said support frame means, air intake means at one axial extremity of said tubular housing, tail pipe means at the other axial extremity of said tubular housing, and exhaust duct means mounted proximate said tail pipe means and directing high velocity air into impingement with the work surface from a position proximate thereto, said exhaust duct means being firmly mounted proximate said tail pipe means by flexural mounts providing a limited resilient attachment protecting said tail pipe means.

4,092,790

FLOATABLE APPARATUS FOR EXCAVATING AND TRANSPORTING EXCAVATED MATERIAL

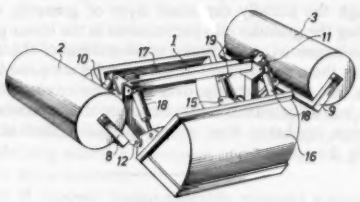
John Teodor Sonerud, Vintervagen 30, 82400 Hudiksvall, Sweden

Filed Dec. 8, 1976, Ser. No. 748,681

Claims priority, application Sweden, Dec. 9, 1975, 7513866

Int. Cl.[2] E02F 3/44

U.S. Cl. 37—71 8 Claims



1. A floatable device for excavating and transporting excavated material, comprising:

a nonfloating frame structure;

a shovel comprising two shovel sections swingably supported directly on said frame structure for relative swinging movement toward and away from one another;

at least two buoyant bodies having a predetermined buoyancy and being movably connected to said nonfloating frame structure at opposite ends thereof;

operating means connected between said frame structure and said buoyant bodies for lowering said frame structure and said shovel as a unit relative to said buoyant bodies

when an excavating operation is to be performed and for raising said unit relative to said buoyant bodies after the excavating operation has been completed and the shovel contains excavated material therein;

drive means connected between said frame structure and said shovel sections for swinging said shovel sections relative to said frame structure, said drive means and said operating means being independently operable in relation to one another, and said drive means causing swinging of said shovel sections when said unit is in said lowered position for performing an excavating operation; and

the buoyant capability of said buoyant bodies together being such that they carry the full load of the shovel and the frame structure in a stable floating condition.

4,092,791

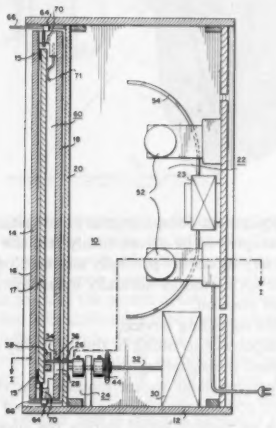
STORED INFORMATION DISPLAY APPARATUS

Arthur A. Apissomian, 411 Westchester Ave., Mt. Vernon, N.Y. 10552

Continuation of Ser. No. 576,285, May 12, 1975, abandoned, which is a continuation of Ser. No. 392,564, Aug. 29, 1973, abandoned. This application May 3, 1976, Ser. No. 682,644

Int. Cl.[2] G09F *11/30, 7/00*

U.S. Cl. 40—470 **16 Claims**



1. An intelligence display apparatus comprising:

(a) an envelope comprising a substantially transparent faceplate;

(b) illumination means for directing light toward said faceplate;

(c) an intelligence selection element disposed in said envelope and between said faceplate and said illumination means, said selection element comprising first regions substantially transparent to said light and second regions substantially opaque thereto, said first and second regions having respective widths in the ratio of about 6:7 to about 8:9;

(d) an intelligence storage element comprising a plurality of discrete and different sets of intelligence, said storage element being disposed in said envelope and between said selection element and said illumination means, said sets individually comprising a plurality of bits respectively embodying different portions of said intelligence, such that said bits of each set collectively comprises a composite of the intelligence of said set, each one of said bits being totally opaque, totally transparent, or both partially opaque and partially transparent to said light said bits of a certain said set of intelligence being substantially aligned with said first regions and the bits of the respective said sets including said certain set, of intelligence are sequentially substantially aligned with said first regions when at least one of said information selection element and said intelligence storage element is moved relative to the other, certain said sets being aligned with said said first regions at certain times and other said sets being not so aligned and another said set being so aligned at another time, said intelligence storage element and said intelligence selection element comprising a unitary structure; and

(e) means for moving at least one of said selection element and said storage element with respect to the other so that said bits of respective ones of said sets are sequentially observable through said first regions.

4,092,792

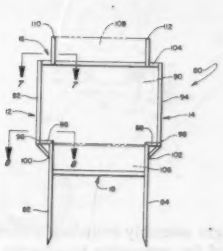
FRAME ASSEMBLY FOR SIGNS

Charles Vorhees, 3844 Riverside Dr., Columbus, Ohio 43220

Filed Jul. 26, 1976, Ser. No. 708,404

Int. Cl.[2] G09F *7/18*

U.S. Cl. 40—607 **2 Claims**



1. A frame assembly for removably retaining a sheet material sign about peripheries thereof comprising:

first and second upright means each having one portion configured for removable insertion into supporting terrain, each having another portion disposed upwardly from said one portion formed of angle stock having elongate flanges mutually integrally associated to exhibit internally disposed surfaces defining an internal angle therebetween extending from an internal apex;

first and second mutually spaced and parallel cross-member assemblies each having termini rigidly connected with said first and second upright means, configured to retain said first and second upright means one and other portions in mutually spaced parallel relationship and retaining at least said other, upwardly disposed, portions in orientations wherein said internal angles thereof are arranged in mutually facing relationship symmetrically disposed about a plane extending in common between the said internal apexes of said spaced first and second upright means other portions, said first cross-member assembly being positioned between said first and second upright means respective other portions at or substantially near the upwardly disposed ends thereof and comprising a first bar member, the oppositely disposed ends of which are rigidly joined with corresponding mutually opposite said internally disposed surfaces at positions thereon spaced from corresponding said apexes;

said one portion being fashioned having a first tip configured for insertion within said terrain and extending along a given axis therefrom a select length to a base support portion extending normally to said axis a select distance to a second tip, said internally disposed surfaces of said base support portion being normally upwardly disposed when said first tip portion is inserted within said terrain;

said other portion associated with said one portion being coplanar with and parallel to said given axis and rigidly coupled with said one portion second tip; and

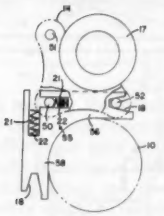
said second cross-member assembly comprising a bar member, the oppositely disposed ends of which are rigidly joined with the said one portion angle stock along the apexes of the internal angle exhibited by the internally

disposed surfaces thereof at respective locations spaced from said base support portion, said section cross-member bar member and that portion of each said one portion angle stock extending to a respective said base support portion providing a three-edge periheral support for at least a second said sheet material sign.

4,092,793
CLIP-ON SIGHT MOUNT

Earl C. Ricks, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1977, Ser. No. 756,318
Int. Cl.[2] F41G *1/38*
U.S. Cl. 42—1 ST **4 Claims**



1. A clip-on sight assembly including a telescope sight, said assembly disposed for removable attachment to a barrel of a weapon comprising:

(a) a bracket for support of said telescope sight thereon, said bracket provided with a pair of normally extending portions having a pair of spaced members provided with first, second and third pins extending therebetween in substantially parallel relation, said first and second pins disposed at the distal ends of said normally extending portions, and said third pin disposed at the juncture of said normally extending portions;

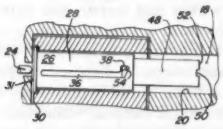
(b) a support member for attachment to said barrel, said support member including a pair of portions in substantially normal relation, said first portion being horizontally disposed across said barrel and said second portion being vertically disposed on said barrel, each said portion having a v-groove along a first surface thereof to receive said first and second pins and a slot along a second surface thereof to receive said third pin, said second surface of each said portion being in adjacent relation; and,

(c) biasing means carried in each said portion of said support member for biased engagement with said third pin.

4,092,794
SAFETY DEVICE FOR GUNS

Robert D. Moren, 6411 W. Fremont Dr., Littleton, Colo. 80123

Filed Feb. 22, 1977, Ser. No. 770,838
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 LP **6 Claims**



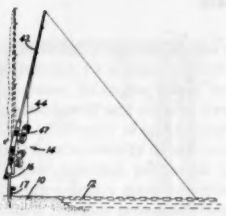
1. In a safety device for a gun having a firing pin, a barrel defining a bore, and a firing chamber for receiving ammunition in alignment with the bore of the barrel of the gun, said safety device including a generally cylindrical open ended shell element adapted to be placed in the firing chamber, a generally cylindrical slide member telescopically receivable in the shell element and resilient means for biasing the slide member outwardly of the shell element, the improvement comprising,

means operatively interconnecting the shell element and slide member for selectively allowing and preventing relative axial movement by rotating the shell element and slide member relative to each other, said interconnecting means including a generally L-shaped slot in the cylindrical wall of one of said shell element and slide member and a protrusion on the cylindrical wall of the other of said shell element and slide member with the protrusion adapted to protrude into said slot to control the relative rotative positions of the shell element and slide member.

4,092,795
FISHING POLE MOUNT AND SIGNAL

Ivan L. Bryant, 1196 N. Ross La., Medford, Oreg. 97501

Filed Jan. 3, 1977, Ser. No. 756,277
Int. Cl.[2] A01K *97/12*
U.S. Cl. 43—17 **2 Claims**



1. Fishing equipment comprising, in combination,

(a) a stake adapted to be driven firmly into the ground,

(b) a pole carrying socket pivotally mounted on the stake,

(c) yieldable spring means normally maintaining the socket in a datum position,

(d) an audible signalling device,

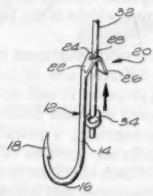
(e) means responsive to tilting of the socket by a tug on the line to sound the signalling device, and

(f) an alternative, silent socket mounted on the stake for holding the rod and the reeled-in line without capacity for producing an audible signal during the silent and clean removal of a fish from the line and hook re-baiting.

4,092,796
FISHING HOOK

George Adams, Box 297, Grover City, Calif. 93433

Filed Apr. 2, 1976, Ser. No. 673,209
Int. Cl.[2] A01K *91/04, 83/00*
U.S. Cl. 43—44.83 **2 Claims**



1. A fishing hook comprising:

a shank having a barbed point terminating at one end thereof and a fishing hook coupler terminating at the other end thereof, said coupler including:

a wire bent upon itself to define a leading stretch of arcuate contour and of sufficient width at its widest point so that

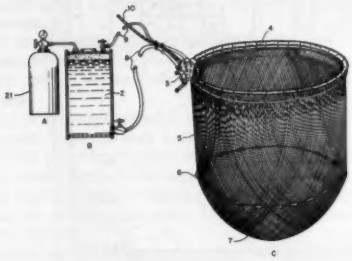
a leader can pass therethrough, a flat inner side follower stretch interconnected at one end of said shank and at one end of said leading stretch, an outer side follower stretch connected at the other end of said leading stretch and terminating in a free end, the inner side follower stretch and said outer side follower stretch defining separate and spaced apart opposed flat adjacent surfaces, and an aperture formed in said leading stretch for enabling a leader to pass therethrough with a knot of said leader lodging in the adjacent surfaces of said inner side follower stretch and said outer side follower stretch.

4,092,797

FISH TRAPPING DEVICE

Salvador R. Azurin, Bigaa, Legaspi City, Philippines

Filed Sep. 20, 1976, Ser. No. 725,000
Int. Cl.[2] A01K *71/00*
U.S. Cl. 43—102 3 Claims



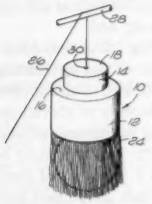
1. A fishing device comprising a fishing net having a closed bottom and an opened mouth; an inflatable flexible tube attached to the opened mouth of said net by means of a plurality of hooks and rings; a rope inserted into the plurality of rings that is adapted to close the mouth of said net as soon as a catch is made and said tube deflated; a tube coupler coupled to both ends of the inflatable tube having air and water intake and discharge ports that are adapted to inflate said inflatable tube and propel the inflated tube in order to float to the water surface and to be propelled sidewise; an air compressor attached to said coupler that is adapted to supply the necessary pressurized air to the flexing floatable tube; and a water pump attached to said coupler that is adapted to supply the necessary pressurized liquid in order to propel said floating tube in a sidewise direction.

4,092,798

BALLOON PINATA

Ramiro Oquita, 6014 Chandler Dr., San Diego, Calif. 92117

Continuation-in-part of Ser. No. 617,602, Sep. 29, 1975. This application Jan. 10, 1977, Ser. No. 758,215
Int. Cl.[2] A63H *35/00*
U.S. Cl. 46—11 6 Claims



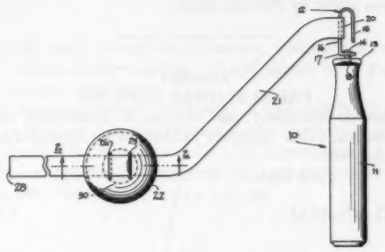
1. A pinata, comprising:
a bottom wall having an extended surface;
side and top walls cooperating with said bottom wall to define a substantially enclosed chamber whereby a plurality of small items may be carried in said chamber on said bottom wall; said chamber including separable parts; and means for holding said separable parts in assembled relation including a balloon and means for suspending said pinata, said latter means being connected to said balloon whereby bursting of said balloon while the pinata is suspended causes said parts to separate thereby opening said chamber for release of the contents of said chamber.

4,092,799

TETHERED EXERCISE DEVICE

Paul R. Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677

Filed Apr. 12, 1976, Ser. No. 675,920
Int. Cl.[2] A63H *33/18*
U.S. Cl. 46—52 2 Claims



1. A tethered exercise device which comprises:
an elongate resilient strap having a closed loop end,
a ball mounted on the strap for reciprocal movement thereon, the ball being of resilient material and having a flexible wall and hollow core, the wall having a first opening in a side wall, a second and third opening in a top wall and a fourth opening substantially opposite the first opening, said openings being adapted to receive said strap therethrough,
a handle,
a pin fastened to the handle, and
a U-shaped hook having an open end leg and a second longer leg, the longer leg further having a closed end loop formed on the lower end thereof, the loop being rotatably mounted on the pin, and the closed loop end of said strap being mounted on said longer leg of the U-shaped hook.

4,092,800

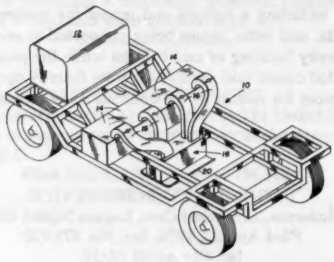
VEGETATION CONTROL

James Robert Wayland, Jr.; Frank S. Davis, and Morris Guy Merkle, all of College Station, Tex., assignors to Phytox Corporation, College Station, Tex.

Continuation of Ser. No. 400,139, Sep. 24, 1973, abandoned, which is a continuation of Ser. No. 225,109, Feb. 10, 1972, abandoned. This application Nov. 2, 1976, Ser. No. 737,909
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—1.3 7 Claims

1. A method of vegetation control, comprising the steps of:
generating an electromagnetic wave having a frequency in the range of from 300 MHz to 300 GHz for emission from an energy radiator;
subjecting an area within which vegetation is to be controlled to the electromagnetic wave emission from the energy radiator; and
reflecting the wave emission after it has passed through the area back into the area of vegetation control to achieve an energy density from approximately 150 Joules/cm^2 to

approximately 300 Joules/cm^2 sufficient to cause the death or debilitation of the vegetation without raising the temperature of the area sufficiently to cause death or debilitation solely by thermal effects.

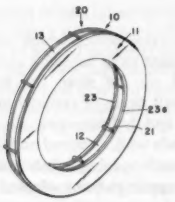


4,092,801

FRESH FLOWER SUPPORT

Leonard H. Schoenherr, and William J. Drablowski, both of Ludington, Mich., assignors to Leonard H. Schoenherr, Ludington, Mich.

Filed Mar. 16, 1977, Ser. No. 778,231
Int. Cl.^{2} A47G *7/00*
U.S. Cl. 47—41.12 **1 Claim**



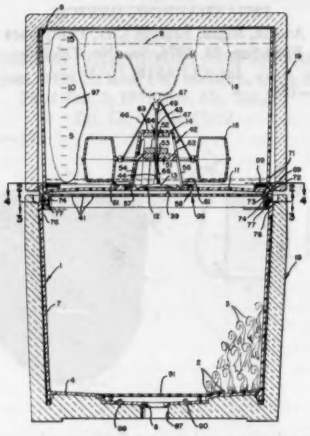
1. A holder for fresh flowers comprising a frame and a body of rigid, open-cell water permeable foam, said body being shaped to form the structural support and shape definition for a wreath, said body being of substantial thickness and having a generally rectangular cross section with front and rear surfaces and having a length substantially greater than either its width or depth; said frame having spaced first wire elements seated around and against the side faces of said body and spaced second wire elements seated against the rear face of said body and generally U-shaped third wire elements having end leg portions joined by web portions, said web portions extending across said rear surface of said body and said end leg portions extending in a rear to front direction across the side faces of said body, said first and third elements intersecting at a plurality of locations and at each intersection being welded together and said second and third elements intersecting at a plurality of locations and being welded together to form a rigid, structural frame of generally channel-like cross section and having an unobstructed front and being substantially open and unobstructed along its side faces between said first and second elements and capable of maintaining its geometric shape and integrity when supporting the foam body saturated with water and loaded with flowers; said frame forming an elongated, recessed pocket of a shape corresponding to that of the foam body and of a size to snugly receive and positively engage and clamp about said foam body and hold it against displacement or geometric reshaping resulting from extended periods of operation under fully loaded conditions with its front face in inclined to vertical position.

4,092,802

SPROUTER FOR HOME USE WITH AUTOMATIC IRRIGATOR

George Clement Oyama, 9, Shiba, Nishi-Kubo Shiroyama-cho, Minato-ku, Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,521
Int. Cl.^{2} A01G *31/00*
U.S. Cl. 47—16 **2 Claims**



1. An apparatus for growing sprouts comprising:

a. a first container for retaining a supply of seeds and for growing sprouts therein having a base formed with a drain opening for passing water and retaining said beans and sprouts and upstanding sidewalls for retaining said sprouts and an intermittent supply of water;

b. a second container removably mounted above said first container for retaining a supply of water having a base formed with a drain opening for discharging water into said first container;

c. a valve mounted in said second container selectively covering said discharge opening a first position and uncovering said discharge opening, in a second position;

d. valve operating means mounted in said second container operatively connected to said valve and including a float responsive to the water level in said second container for opening said valve at a pre-selected upper elevation and closing said valve at a lower pre-selected elevation;

e. water inlet regulating means for supplying water to said second container at a pre-selected rate;

f. means regulating the ingress and egress of air to and from said first container; and

g. said air regulating means includes;

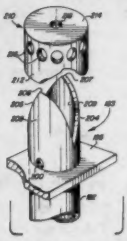
1. the upper edge of said upstanding sidewalls of said first container is formed with repeating stepped lands positioned at a plurality of elevations; and

2. a ring member positioned between said first and second containers formed with mating repeating stepped lands positioned at a plurality of elevations for raising said second container above said first container at selected varying elevations depending upon selected relative rotational positions of said first container and said ring member.

4,092,803
SELF-WATERING APPARATUS FOR PLANTS

Thomas H. Naylor, P.O. Box 370, Castle Rock, Colo. 80104

Filed Aug. 2, 1976, Ser. No. 710,436
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—62 18 Claims



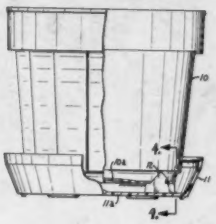
1. Watering and draining apparatus for plants, comprising, in combination:
- a tank for holding a quantity of water;
- tray means for holding plants;
- supply conduit means extending from the tank to the tray means;
- a valve in the supply conduit means for controlling the flow of water from the tank to the tray means;
- means for providing a flow of water from the tank to the tray means through the supply conduit means;
- return conduit means extending from the tray means to the tank for draining the water from the tray means to the tank, including
- an interior upright drain conduit disposed within within the tray means,
- drain aperture means in the interior upright drain conduit to provide a continual first flow of water from the tray means,
- cap means, including a top and a skirt extending downwardly substantially perpendicular to the top, disposed on the interior upright drain conduit and movably adjustable thereon,
- a plurality of apertures extending through the skirt of the cap means and communicating with the interior upright drain conduit to provide a selectively varied second flow of water from the tray means,
- an aperture extending through the top of the cap means for admitting a flow of air into the return conduit means, and
- a relieved portion on the interior upright drain conduit selectively communicating with the plurality of apertures extending through the skirt of the cap means for varying the second flow of water from the tray to the return conduit means.

4,092,804
FLOWER POT AND INTERLOCKING SAUCER

Donald A. Morris; Eddie A. Wilson, and Eric A. Little, all of Lawrence, South Korea, assignors to Packer Plastics, Inc., Lawrence, Kans.

Filed Feb. 16, 1977, Ser. No. 768,970
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 6 Claims

1. An interlocking molded saucer for a container having a bottom with a plurality of spaced holes, each said hole having an edge substantially tangential to a radius R, said saucer comprising:
- a saucer bottom portion;
- a continuous side wall integrally molded to said bottom portion around the perimeter thereof; and
- a plurality of fastener members integrally molded with said saucer bottom portion, each said member having a container abutting surface disposed from the center of said saucer bottom a distance substantially equal to said radius R and each said member further including an angled arm having an inclined outer end and further having a lower edge inclined from the horizontal at an angle α and an upper edge inclined from the horizontal at an angle β such that angle α is greater than angle β, said lower edge of said angled arm terminating at a point from the center of the saucer bottom equal to a radius S such that the absolute value of the difference between radius S and radius R falls

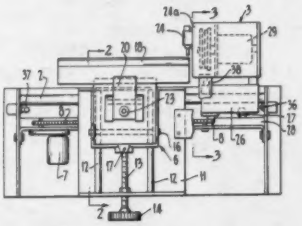


in the range of 0.01 to 0.06 inches, whereby said saucer structure enables molding of said saucer by a fixed or stationary type mold;
- said fastener members being aligned with said holes of the container so that said container and saucer may be pressed together in releasably interlocking fashion with a portion of each said angled arm penetrating a corresponding hole in said container.

4,092,805
APPARATUS FOR SHARPENING MICROTOME BLADES

Patrick Robert Williams, Cowes, Australia, assignor to Temtool Pty., Ltd., Australia

Filed Apr. 21, 1976, Ser. No. 678,916
Int. Cl.[2] B24B *3/36*
U.S. Cl. 51—85 BS 2 Claims



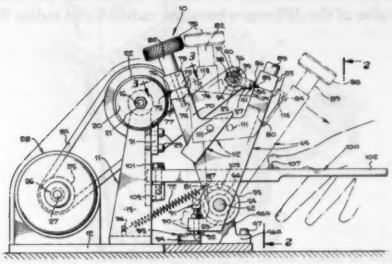
1. Apparatus for sharpening blades including a carrier for a blade, a carriage moveable in a direction spaced from the carrier, along the length thereof, the carriage carrying at least one pair of disc stops which are side by side and overlapping and which can be selectively driven at two speeds, the blade carrier having means whereby its angular position can be altered so that a blade in the carrier can be brought, selectively, into contact with one or other of the strops, wherein associated with each strop there is a wheel having a surface of a material having high frictional characteristics, the wheel interengaged to drive the strops in a contra-rotating manner, wherein each strop is associated with a motor, one of the motors being a high speed motor to enable forming of the blade and the other being a low speed motor to enable the blade to be polished.

4,092,806

KEY DUPLICATING MACHINE

Horst W. Wich, 816 Brent St., South Pasadena, Calif. 91030

Filed Nov. 17, 1976, Ser. No. 742,619
Int. Cl.[2] B24B *17/02*; B21K *13/00*
U.S. Cl. 51—100 R **3 Claims**



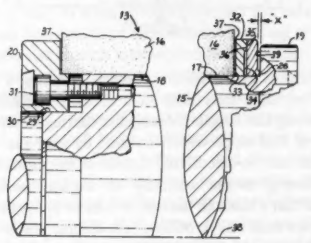
1. A key duplicating machine comprising:
a rotatable grinding wheel having a peripheral cutting edge;
a guide member having a reference edge supported at a fixed distance relative to the cutting edge of said grinding wheel;
a shaft disposed parallel to the axis of said grinding wheel;
mounting means for supporting said shaft for movement along and for rotating about the axis thereof;
a keyholder attached to said shaft, said keyholder providing for holding a key blank and an existing key having notches thereon;
biasing means for causing said existing key on said keyholder to bear against the reference edge of the guide member as the shaft is moved along its axis to thereby cause said key blank on said keyholder to be rocked about the axis of the shaft laterally into the cutting edge of the grinding wheel to remove material therefrom in accordance with the notches on the existing key;
a linear cam provided with a ramp thereon; and
projecting means on said keyholder operable upon contacting the ramp on said linear cam as said keyholder is moved along the axis of said shaft to rock said keyholder about the axis of said shaft away from the cutting edge of the grinding wheel into a normal rest position.

4,092,807

WHEEL CLAMPING DEVICE

George Luther Grove, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 10, 1976, Ser. No. 749,466
Int. Cl.[2] B24B *41/00*
U.S. Cl. 51—168 **3 Claims**



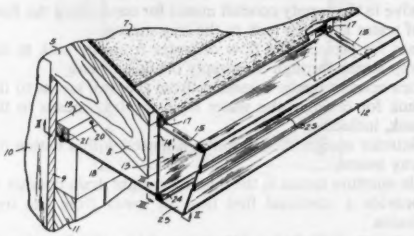
1. In a machine tool having a rotatable spindle with a spindle diameter adapted to support a cutting wheel, a spindle flange radially adjacent to the spindle diameter, and a clamping flange which is securable to the spindle so as to clamp a cutting wheel disposed between the flanges, an improved wheel clamping device comprising:
(a) a belleville-type spring disc interposed between said wheel and one of said flanges and coaxial therewith, adapted for compression to a working deflection, said spring disc thereby accommodating an interval of positive or negative spring deflection from the working deflection, yet maintaining a substantially constant working load throughout said interval;
(b) a plate adapted to be interposed between said spring disc and a side of a clamped wheel; and
(c) a face relief in said plate to accommodate spring disc movement.

4,092,808

COMBINATION EAVES TROUGH AND FASCIA WITH SOFFIT CONNECTION MEANS, AND METHOD OF MAKING SAME

John E. Maloney, Jr., Addison, and Richard F. Zaccagni, Lombard, both of Ill., assignors to ZMC, Inc., Addison, Ill.

Continuation-in-part of Ser. No. 506,359, Sep. 16, 1974, abandoned. This application Jul. 2, 1975, Ser. No. 592,388
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—11 **15 Claims**



1. A combination eaves trough and fascia with soffit connection means, comprising:
an elongated, generally channel-shaped, upwardly opening gutter member roll-formed from one continuous strip of sheet metal and having a flat horizontal bottom wall and spaced apart upstanding front and back walls and adapted to be mounted directly on the ends of rafter tails of an overhanging eaves structure of a building roof;
said front and back walls having respective free upper portions and being integrally joined at their bottom portions to said bottom wall;
the vertical dimensions of said front and back walls and thereby the vertical dimensions of the gutter member being such that the upper portion of said back wall can lie adjacently under the roof drip line and the lower portion of the gutter member including the bottom wall will be located below the rafter tails whereby the gutter member will serve as combination gutter and fascia;
the upper portion of said back wall providing means for securing the gutter member to the rafter tail ends; and
an integral groove recessed reinforcing rib roll-formed directly in and integrally in one piece with the sheet metal material of the gutter member horizontally in and along the lower portion of the gutter member at the juncture between the bottom wall and one of said upstanding walls;
the groove recessed rib defining a horizontal socket groove opening toward the back of the gutter member to receive an edge of a soffit panel;
said groove recessed rib being of a reentrant socket groove formation and having a pair of vertically spaced horizontal socket groove wall flanges and a vertical spacer socket groove root wall coextensive with said horizontal flanges and defining the socket width of said groove, and stiffening junctures joining said horizontal socket groove wall flanges to said vertical spacer socket groove root wall

flange and to said one upstanding wall of the gutter member, said junctures cooperating with said wall flanges in attaining reinforcing stiffness in said groove recessed rib and thereby in the lower portion of said one upstanding wall and the gutter member in general;

the lowermost of said horizontal socket groove wall flanges comprising a return bent folded face-to-face double thickness of material wherein one thickness of the fold is integral with the lower edge of said one upstanding wall and the other thickness is integral with said bottom wall;

said thicknesses of material being joined together along a simple return bend providing a thin edge integral connection facing toward the back of the gutter member;

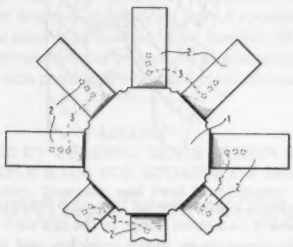
whereby when the edge of a soffit panel is received in said groove the appearance will be afforded of the soffit panel being substantially a continuation of the bottom wall of the gutter member.

4,092,809

DOMED ROOF STRUCTURES FOR EASY ASSEMBLY AND DISMANTLING

Frederic Edward Bellas, 148 Zerbey Ave., Edwardsville, and Robert Anthony Decker, 204 Shoemaker St., Swoyersville, both of Pa. 18704

Filed Aug. 20, 1976, Ser. No. 716,143
Int. Cl.[2] E04B *1/347*
U.S. Cl. 52—63 **14 Claims**



1. A domed roof structure to enclose an area, the outer periphery of said area defined by a base, comprising:

a. a dome plate having a central body and a plurality of dome tenons protruding radially therefrom, each dome tenon having a rectangular cross-section,

b. a plurality of rib sections, being generally rectangular in cross-section, each having a rib mortise on one end and a rib tenon on the other end,

c. means for coupling said dome tenons fixedly to said rib mortises comprising a series of longitudinally spaced notches defined in said dome tenons and a spring loaded coupler mounted on said rib section which comprises a locking bolt of a size accommodatingly smaller than said notches, a spring placed circumferentially around said locking bolt and a cartridge to accommodate said locking bolt and spring whereby said dome tenon is inserted into said rib mortise, said locking bolt is retracted, thereby compressing said spring, one of said notches is lined up with said locking bolt and said locking bolt is inserted into said notch to form a firm coupling,

d. a plurality of seat plates mounted on said base, each seat plate comprising an upturned top section having a seat mortise having a generally retangular cross section, lower horizontal section and a lower vertical section,

e. means for mounting said lower horizontal section of said seat plate on said base,

f. means for coupling said rib tenons to said seat mortises thereby forming a skeletal framework of the domed roof structure, comprising a series of longitudinally spaced notches defined in said rib tenon and a spring loaded coupler mounted on said seat mortise which comprises a locking bolt of a size accommodatingly smaller than said notches, a spring placed circumferentially around said locking bolt and a cartridge to accommodate said locking bolt and spring whereby said rib tenon is retracted thereby compressing said spring, one of said notches is lined up with said locking bolt and said locking bolt is inserted into said notch to form a firm coupling,

g. a cover drawn over said skeletal framework to enclose the area desired and,

h. means for anchoring said cover to said domed roof structure.

4,092,810

DOMICAL STRUCTURE

John S. Sumner, 728 N. Sawtelle, Tucson, Ariz. 85716

Filed Mar. 16, 1977, Ser. No. 778,032
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—81 **2 Claims**

1. A roof for a domical structure comprising:

a plurality of scalene triangular panels, interconnected along their peripheries to form a domically shaped roof,

each of said panels comprising three curved triangles formed in the corners of each curved triangular sector and interconnected by an interior plane triangle and bent in different directions along the interconnection of each curved triangle with the plane triangle to form a plurality of singly curved surfaces,

each of said panels positioned adjacent to the edge of an adjoining panel to form a mirror image of the other and comprising a pair,

each panel of each pair being interconnected with its mirror image of another panel of a juxtapositioned pair of said panels, and

the interconnection between adjacent panels lying substantially along arcs of great circles of the domical structure and forming the framework of the structure,

said panels overlapping to form said interconnection between adjacent panels,

said roof comprising a structure formed only from edge to edge connected planar panels, and being free of other supporting framework.

4,092,811

COOLING TOWER, CONSTRUCTION METHOD THEREFOR AND PRECAST PRESTRESSED CONCRETE BUILDING UNITS

Tung-Yen Lin, El Cerrito, and Yue-Chyou Yang, San Francisco, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Filed Feb. 14, 1977, Ser. No. 768,175
Int. Cl.[2] E04H *12/16*
U.S. Cl. 52—224 **11 Claims**

1. A cooling tower or the like, comprising:

a foundation having water collection means,

a series of angularly-extending columns secured to said foundation and leading upwardly therefrom,

a lower ring joining the upper ends of all said columns,

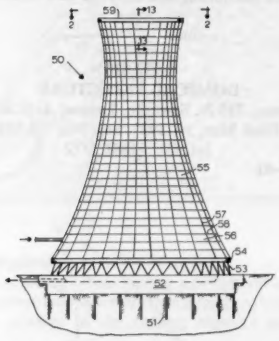
a ribbed, waffle-like reinforced concrete wall extending up

from said lower ring to provide a veil with a thin skin and ribs strengthening the structure and enabling the thickness of said skin to be relatively thin,

said wall including a series of post-tensioning tendons, and an upper ring at the top of said wall,

said wall being provided by:

a series of tiers of precast reinforced concrete panels, each panel having said ribs along edge portions thereof and defining a cavity where adjacent panels meet,



some of said post-tensioning tendons being horizontally disposed at some of said tiers of panels,

a series of upwardly-extending steel cages, one cage lying between each pair of adjacent penels of the same tier and enclosed by portions of said ribs, some of said post-tensioning tendons passing through said cages, and

poured-in-place concrete filling the remainder of said cavities and said cages.

4,092,812

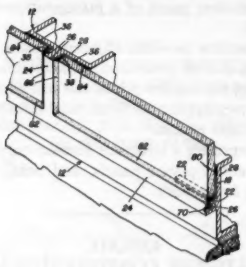
SILICONE GLAZING SYSTEM

Richard F. Dashner, Wheaton, Ill., and George J. Bouchey, Millburn, N.J., assignors to General Electric Company, Waterford, N.Y.

Filed Aug. 5, 1976, Ser. No. 712,123

Int. Cl.[2] E04C *1/00*

U.S. Cl. 52—309.3 **16 Claims**



1. A window pane construction in which the window pane is substantially flush with the exterior wall of a building and in which there is no external abutment lip on the external surface of said window pane comprising a four-sided window frame which has supporting sides extending around said opening and perpendicular to the opening in said window frame and lip sides which are perpendicular to said supporting sides and extending from the interior from said supporting sides to the edge of the building exterior, spacer rods formed from a heat vulcanizable silicone rubber of at least 30 Durometer Hardness extending along all four of said supporting sides of said window frame and extending along all four of said lip sides, but such that said spacer rods on said lip sides do not cover all of the surfaces of said lip sides which are perpendicular to the opening in said window frame so as to leave a toe surface on said lip sides, said toe surface extending on all sides of said window frame and external-most from the interior of the building, a window pane resting on and against and supported by said spacer rods, and a layer of a room temperature vulcanizable silicone rubber sealant applied over the exposed external surfaces of said spacer rods and extending from the toe surface on said lip sides to the edge of said window pane such that when said sealant has cured, the cured sealant maintains said window pane in place in conjunction with said spacer rods.

4,092,813

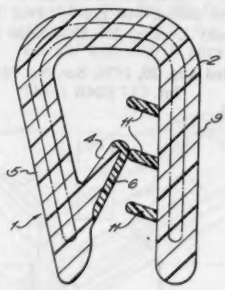
EDGE PROTECTOR TRIM STRIP

Frank Eggert, Hamburg, Germany, assignor to Schlegel (UK) Limited, Seacroft Leeds, England

Filed Nov. 1, 1976, Ser. No. 737,608

Int. Cl.[2] E04B *1/62*; E04F *15/14*

U.S. Cl. 52—397 **3 Claims**



1. A one-piece edge protector trim strip for application to an applied position on a metal flange or the like such as that found around door openings on motor vehicles, said strip having a body of generally U-shaped cross section, formed of polymeric material, and resiliently deformable gripper fins extending from the arms of said U-shaped body inwardly thereof throughout the length of said strip, wherein said gripper fins comprise a first single deformable gripper fin on one of the arms of said U-shaped body in which the major portion of said first fin is formed of a first deformable material of one hardness, and a plurality of gripper fins of a second deformable material softer than said first deformable material on the other arm of said U-shaped body whereby said plurality of gripper fins are collapsed when said trim strip is in its applied position for accommodating flanges of different thicknesses, preventing ingress of water into said trim strip, and presenting anti-sliding friction surfaces in engagement with the flange for resisting removal of said trim strip from the flange, and wherein a minor surface portion of said first gripper fin facing said plurality of gripper fins is of a third deformable material softer than said first deformable material and cooperates with said collapsed plurality of gripper fins to maximize the frictional forces resisting removal of said trim strip from the flange while minimizing the frictional forces resisting application of said trim strip on the flange.

4,092,814

REINFORCING ROD

Georg Kern, Munich, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Mar. 7, 1975, Ser. No. 556,465

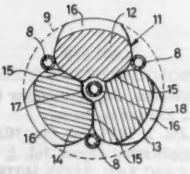
Claims priority, application Germany, Mar. 15, 1974, 2412459

Int. Cl.[2] E04C *3/30*

U.S. Cl. 52—730 **2 Claims**

1. A steel reinforcing member especially suitable as a ten-

sioning member, one end of which is embedded in a dead end type of borehole and having a continuous central passage therethrough suitable for injecting cementing material into, or for venting air from such a borehole, comprising at least two individual, continuous steel rods each having the approximate cross-sectional shape of a sector of a circle so that each rod comprises two radial flat longitudinal surfaces and a circumferential surface, said rods being assembled with the adjacent radial surfaces of the rods in contact to form the reinforcing



member with a cross-section which is substantially circular, the circumferential surfaces of each of said rods containing ribs thereon so constructed as to form a helical pattern on the assembled member, each of said rods having a recess extending the entire length thereof in the region where the two radial surfaces would meet to provide said continuous central passage, the outer edges of at least one pair of contacting radial surfaces of the assembled member being rounded off to form a recess in the circumferential portion of the assembled member, and a conduit tube positioned along said circumferential recess.

4,092,815

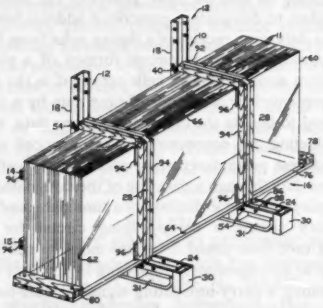
METHOD OF LOADING GLASS SHEETS ON A COLLAPSIBLE RACK FOR STORING OR SHIPPING

James R. Rowley, Freeport, and Paul D. Majesky, Upper St. Clair, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 576,916, May 12, 1975, Pat. No. 4,014,435, which is a continuation-in-part of Ser. No. 493,440, Jul. 31, 1974, abandoned. This application Nov. 17, 1976, Ser. No. 742,382

Int. Cl.[2] B65B *13/02*

U.S. Cl. 53—3 **7 Claims**



1. A method of loading sheets on a collapsible rack, comprising the steps of:

providing a pair of rigid L-shaped supports each having (1) a vertical leg joined to a horizontal leg and (2) a rigid guideway therein positioning flexible banding in the guideway of each of the L-shaped supports;

inserting pins in the L-shaped supports to maintain the banding in the guideways;

providing a base having a pair of spaced ribs on a major surface, the ribs being sized for slideable insertion in the guideways of the L-shaped supports;

mounting the base on the horizontal leg of the L-shaped supports with the ribs of the base in the guideways of the L-shaped supports on top of the banding therein to prevent sideway motion of the L-shaped supports and to provide an assembly rack;

loading a plurality of sheets on the rack in a generally vertical position; and

securing the sheets on the rack.

4,092,816

INNER FOIL WRAPPING DEVICE

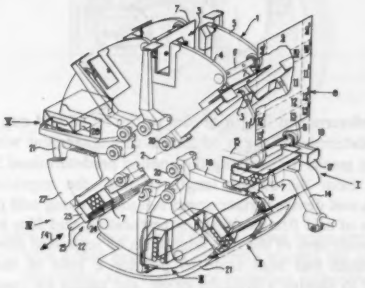
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societá Per Azioni, Bologna, Italy

Filed Mar. 25, 1977, Ser. No. 781,525

Claims priority, application Italy, Mar. 31, 1976, 3389A/76

Int. Cl.[2] B65B *11/32*

U.S. Cl. 53—234 **2 Claims**



1. A device made for inner foil wrapping with the length's long ends over one of the larger faces of a bundle of cigarettes in very high speed soft packet cigarette packers, the device comprising a head or wheel turning at intervals and fitted with a number of radially positioned compartments equidistant from one another, each said compartment being capable of receiving a bundle of cigarettes for packeting laid long sides to the axis of rotation of said turning head or wheel; and a plurality of fixed and moving folder means in combination with said turning head or wheel for packeting operations with the length of foil, one of the said folder means being set at a tangent to the peripheral fascia of said turning head or wheel corresponding to a stay position occupied successively by said compartments of said turning head or wheel with alternating movement radial to said turning head or wheel, a wall of each compartment above that said one of said folder means with alternative movement in the sense of rotation of said turning head or wheel comprising a thin plate and said one folder means also having a thin plate facing said turning head or wheel so as during its forward movement to rebut the after ends of the length of foil onto the surface of the former plate external to the corresponding compartment, and wherein said folder means includes: a pair of radially oscillating arms with a platelet joined to an end of each said arm, said platelets contacting the two long ends of the outer side of the bundle of cigarettes; and a fixed guide concentric to said turning head.

4,092,817

FILM APPLYING DEVICE WITH A STRAW-HOLE PERFORATOR

Karl Frederick Rist, III, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

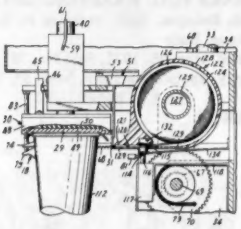
Filed Jan. 31, 1977, Ser. No. 763,991

Int. Cl.[2] B65B *7/28;* **B67B** *3/04*

U.S. Cl. 53—298 **8 Claims**

1. In a device for applying predetermined lengths of a heat

sealable film over the open ends of cups from a supply length of the film, said device comprising: means adapted for advancing an end of a said strip of heat sealable film along a path from a first position to a second position, said positions being spaced a distance equal to said predetermined length; means adapted for supporting a said cup in said device; means for providing relative movement between said means adapted for supporting and a said predetermined length of the film extending between said first and second positions, said means for providing relative movement being adapted to bring the lip of the cup into full circle engagement with one surface of the predetermined length of film; means for applying heat and pressure to fuse



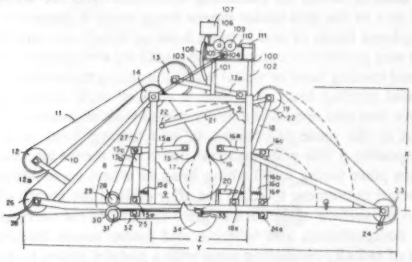
said predetermined length of film to the lip of said cup when the predetermined length of film is in engagement with the cup; and means for severing the applied predetermined length of film from the supply length of film, the improvement wherein said device further comprises means along said path in advance of said first position for perforating said film to provide a small area of the film which can be separated along the perforations and bent aside to provide a hole in the film adapted to receive a drinking straw, and means for operating said means for perforating before operation of said means for advancing to provide a said small area in each predetermined length of film applied to a cup.

4,092,818

HAY BALER

Donald H. Brewster, 2630 Creek Rd., Sandy, Utah 84070

Filed Feb. 17, 1976, Ser. No. 658,239
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **8 Claims**



1. A hay baler for forming large cylindrical bales of hay comprising:

a. frame means for supporting said baler;

b. means for picking up loose hay from the ground;

c. endless belt transport means for transporting said loose hay to an elevated position;

d. a loop of an endless belt in said baling section to receive hay from said elevated position and form cylindrical bales of hay as said belt travels said endless belt being the same endless belt as the belt forming said transport means;

e. means for propelling said belt; and

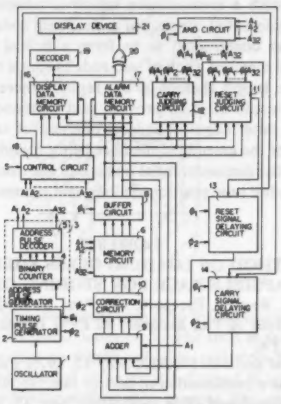
f. discharge means to discharge said bale from the end of said baler opposite said hay pick-up means.

4,092,819

ELECTRONIC TIMEPIECE CIRCUIT

Tsuneo Takase, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 2, 1976, Ser. No. 702,198
Claims priority, application Japan, Jul. 2, 1975, 50-80984
Int. Cl.[2] G04C *3/00, 21/00;* H03K *21/32*
U.S. Cl. 58—23 R **5 Claims**



1. An electronic timepiece which comprises a clock pulse oscillator; a timing pulse generator for dividing the frequency of a clock pulse produced by the clock pulse oscillator to issue a timing pulse; an address pulse generator for sending forth address pulses to designate a prescribed address being stored with a time data upon receipt of a timing pulse from the timing pulse generator; a memory circuit formed of a plurality of static random access memory cells arranged in the form of a matrix represented by a number of time data by a number of bits required to denote the code of each time data, and, when a word-selecting line connected to a memory cell is supplied with an address pulse designating said memory cell, sending forth a time data through a data line of the designated memory cell; a display device for displaying a time data read out from the memory circuit; a carry-judging circuit for deciding whether a time data issued from the memory cell should be carried up to an immediately following higher unit time level and generating a carry-instructing signal; a reset-judging circuit for generating a reset-judging circuit for generating a reset-instructing signal where carry is required, to clear the carried time data; a first delay circuit for holding a carry-instructing signal delivered from the carry-judging circuit until a time data being carried is received; a second delay circuit for holding a reset-instructing signal until a time data being cleared is received; an adder for adding a carry signal supplied from the first delay circuit and a minimum unit time signal to a time data read out from the memory circuit; and a correction circuit for correcting a time data delivered from said adder upon receipt of a reset signal from the second display circuit.

4,092,820
ELECTRONIC TIMEPIECE

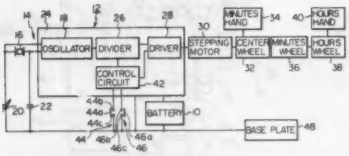
Kazunari Kume; Minoru Watanabe, both of Tokorozawa; Hideshi Oono, Sayama, and Munetaka Tamaru, Tokyo, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,577

Claims priority, application Japan, Mar. 25, 1975, 50-035795; May 30, 1975, 50-064172

Int. Cl.[2] G04B *27/08*; G04C *3/00, 9/00*

U.S. Cl. 58—23 R **9 Claims**



1. An electronic timepiece comprising, in combination: a frequency standard providing a relatively high frequency signal;

a frequency converter dividing down the relatively high frequency signal;

to provide a first low frequency signal, a second low frequency signal lower in frequency than said first low frequency signal, and a third low frequency signal lower in frequency than said second low frequency signal;

first and second manually operable switches;

a control circuit including means for generating first and second outputs when said first and second manually operable switches are actuated, respectively, means for generating a first output signal in reponse to at least said first output and said first low frequency signal, and means for generating a second output signal in response to at least said second output and said second low frequency signal;

a driver circuit normally providing first driving current pulses in response to said third low frequency signal and responsive to said first and second output signals from said control circuit to provide second and third driving current pulses, respectively, at frequencies equal to those of said first and second low frequency signals; and

an electro-mechanical transducer normally driven by said first driving current pulses to advance rotatable time-representing members stepwise once per every one unit time and responsive to said second and third driving current pulses to advance said time-representing members at first and second speeds higher than a normal rotational speed in which said electromechanical transducer is driven by said first driving current pulses, whereby time correction can be performed at different speeds.

4,092,821
CONTROL DEVICE FOR AN ELECTRONIC WATCH

Carl A. Wirz, Weinbergstrasse 26, 6300 Zug, Switzerland

Filed Nov. 17, 1976, Ser. No. 742,457

Claims priority, application Switzerland, Dec. 2, 1975, 15615/75; Mar. 2, 1976, 2542/76

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 BA **8 Claims**

1. A watch comprising

a casing defining a chamber and including a peripheral wall having at least one through bore and a notch;

battery means in said chamber;

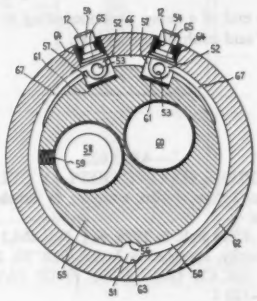
an electronic module in said chamber having at least one notch in its periphery and at least one terminal at its periphery; and

control means including

at least one push-button in said through bore and radially slidable therein;

a return spring means electrically connected to said battery means cooperating with said push-button and comprising a substantially circular return spring having two opposing ends and substantially encircling said module, said return spring having a middle portion thereof with a substantially rectangular cross-section and comprising,

a boss for engaging in said notch of said casing in order to locate said return spring with respect to the casing and also for engaging in said notch of said module in order to locate said module with respect to said return spring,



each of the ends of said return spring being terminated with a boss projecting inwardly toward the center of the casing, said end bosses including respective bores usable to facilitate the seizure of the return spring during its assembly in the watch,

the radial thickness of the return spring being reduced over a certain length between each of said terminating boss and the rectangular section of said spring in order to create a resilient part of the return spring which, when actuated by the push-button pushed radially inwardly in said through bore of said casing, will move inwardly so that the terminating boss establishes a good electrical contact with the terminal of the module, the resilience of said part of reduced section being sufficient to break such contact and return said push-button to its original rest position.

4,092,822
CONTROL DEVICE FOR AN ELECTRONIC WRIST-WATCH

Willy Droz, Hauterive, and Jean-Luc Béguin, Neuchatel, both of Switzerland, assignors to Ebauches SA, Neuchatel, Switzerland

Filed Nov. 25, 1975, Ser. No. 635,089

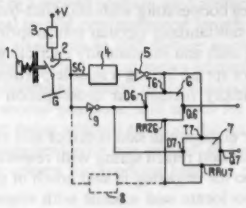
Claims priority, application Switzerland, Dec. 11, 1974, 16373/74

Int. Cl.[2] G04B *27/08*

U.S. Cl. 58—23 R **11 Claims**

1. A control device for electronic watches, comprising a push button switch for providing a control signal, delay means and first and second flip-flop circuits, inputs of each of said flip-flop circuits being connected to said push button switch by said delay means and by non-delayed circuit means, said control signal being applied to said inputs with and without delay respectively, one output of each of said flip-flop circuits being an output of said control device, and resetting means for said first and second flip-flop circuits adapted to reset said flip-flop circuits into complementary initial conditions, different combi-

nations of output information being thus obtained at the outputs of said flip-flop circuits and of the control device respec-



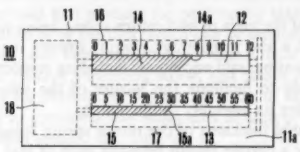
tively at the end of a delay time according to the duration of actuation of said push button switch.

4,092,823

TIMEPIECE HAVING DISPLAY CYLINDERS

Sonobe Shiro, Tokyo, Japan, assignor to Sansho Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,118
Claims priority, application Japan, Feb. 10, 1975, 50-17720
Int. Cl.² G04B *45/00, 19/02, 19/02*
U.S. Cl. 58—125 C **5 Claims**



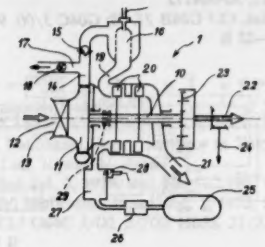
1. A timepiece comprising a casing, an hour cylinder and a minute cylinder contained in said housing, driving means for rotating said cylinder at a constant speed of one revolution every 12 hours for said hour cylinder and one revolution every 60 minutes for said minute cylinder, and a dial plate mounted on said casing, said dial plate being provided with hour and minute windows extending in the axial direction of said hour and minute cylinders, said hour window being parallel with said hour cylinder and being marked with a plurality of digits for displaying hours and said minute window being parallel with said minute cylinder and being marked with a plurality of digits for displaying minutes, the outer periphery of each of said cylinders being divided into two areas by a line inclined at a predetermined angle with respect to the axis of each said cylinders and said two area being colored by different colors, wherein said driving means comprises a first shaft driven at a constant speed by said driving means, a first pinion mounted on said first shaft for driving a second pinion mounted on a second shaft, a third pinion rotatably mounted on said second shaft, a pin and slot connection between said second and third pinions, spring means surrounding said second shaft for normally engaging said pin and slot, a fifth pinion meshing said third pinion for driving said minute cylinder, a third shaft continuously rotated by said first shaft, a first cam wheel mounted on said third shaft, a fourth shaft driven by said third shaft, a second cam wheel cooperating with said first cam wheel, a third cam wheel cooperating with said third pinion, said second and third cam wheels being rotatably mounted on said fourth shaft, spring means interposed between said fourth shaft and said second cam wheel, and means for driving said hour cylinder in accordance with the intermittent rotation of said second cam wheel.

4,092,824

METHOD OF OPERATING A TURBINE

Helmut Friedrich, Stuhr, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed May 28, 1974, Ser. No. 473,500
Int. Cl.² F02C *7/00, 7/32*
U.S. Cl. 60—39.02 **8 Claims**



1. Method of operating an auxiliary gas turbine which is used for starting an aircraft engine and for driving auxiliary onboard equipment comprising the steps of, generating externally to the turbine a pressurized gas without sustaining combustion, for driving the turbine;

mixing the pressurized gas after its generation with aircraft engine fuel; and

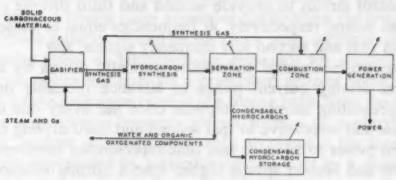
feeding the mixture to the turbine for driving the turbine, so that the turbine is driven by the mixture without undergoing or having undergone combustion.

4,092,825

PROCESS FOR BASE-LOAD AND PEAK-LOAD POWER GENERATION

Clark J. Egan, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 613,654, Sep. 15, 1975, Pat. No. 3,986,349. This application Sep. 16, 1976, Ser. No. 724,124
Int. Cl.² F02B *43/08*
U.S. Cl. 60—39.02 **10 Claims**



1. A process for the generation of power from a solid carbonaceous material which comprises:

(a) forming a combustible synthesis gas by reacting said carbonaceous material with steam and oxygen at an elevated temperature;

(b) contacting a first portion of said synthesis gas with a hydrocarbon synthesis catalyst, thereby forming a reaction product mixture containing water, H_2, CO, CO_2, oxygenated organic compounds and synthetic hydrocarbons;

(c) contacting said reaction product mixture prior to formation of an aqueous phase therein with a hydrogenation catalyst under hydrogenation conditions, thereby converting said organic compounds to water and combustible hydrocarbons;

(d) thereafter separating from said reaction product mixture C_3+ hydrocarbons;

(e) combusting a second portion of said synthesis gas and generating power from the resulting combusted synthesis gas; and

(f) combusting at least a portion of said C_3+ hydrocarbons and generating additional power from the resulting combusted hydrocarbons.

4,092,826

FUEL INJECTORS FOR GAS TURBINE ENGINES

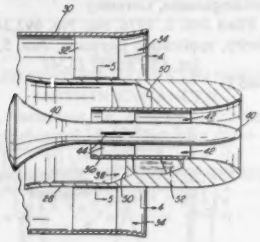
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 30, 1976, Ser. No. 746,016

Claims priority, application United Kingdom, Dec. 6, 1975, 50130/75

Int. Cl.[2] F02C 7/22

U.S. Cl. 60—39.74 R 6 Claims



1. A fuel injector for a gas turbine engine comprising: an elongated cylindrical hollow body having a downstream end, an upstream end and an interior surface opening at least to said downstream end; means defining a passage through the fuel injector for flow of compressed air; an orifice extending through the side of said hollow body intermediate the downstream end and the upstream end thereof and opening through said interior surface to the interior of the hollow body; a fuel supply duct extending into said orifice from the exterior of the hollow body and communicating with the interior of said hollow body through said orifice to supply fuel tangentially onto the interior surface of said hollow body, and a continuous helical wall projecting radially inwardly from said interior surface from a position immediately upstream of said orifice and extending at least 360° around said interior surface to a position downstream of said orifice whereby fuel supplied through said fuel supply duct is prevented from returning outwardly through said orifice.

4,092,827

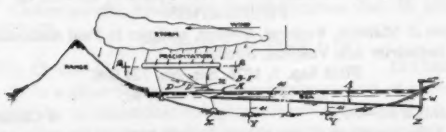
APPARATUS FOR AERIAL WATER ACQUISITION AND SUB-SEA AQUEDUCT

Gerald J. Schneider, 14923 Moorpark St., Sherman Oaks, Calif. 91403

Filed Apr. 21, 1977, Ser. No. 789,649

Int. Cl.[2] F15B 1/06; B64B 1/50

U.S. Cl. 60—398 37 Claims



1. Apparatus for the acquisition of rain water and including, a funnel supported aerially by balloon means and together forming an elevated basin tethered at and over a reservoir and with a duct from said funnel to said reservoir for the immediate gravitation of acquired rain water into storage.

4,092,828

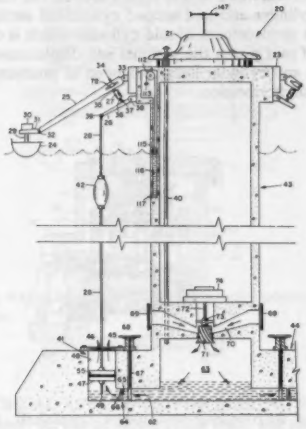
HYDROELECTRIC PLANT

Roberto M. Garza, P.O. Box 7036, San Antonio, Tex. 78207

Continuation-in-part of Ser. No. 684,796, May 10, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,462

Int. Cl.[2] F03B 13/12

U.S. Cl. 60—506 10 Claims



1. A hydroelectric plant for generating energy from wave action of a body of water comprising:

plant structure located in the body of water;

first lever means pivotally connected at a first end to and extending downward from said plant structure to a surface of said body of water;

float means attached to a second end of said first lever means for floating on said surface;

second lever means pivotally connected to said plant structure;

crosshead means pivotally connecting said first lever means to said second lever means;

cylinder means operatively connected to said second lever means to move a piston means therein in response to said wave action against said float means, said piston means reciprocating in said cylinder means to move a fluid therethrough;

first control means for generating a first control signal in response to height of said wave action, said first control signal adjusting said crosshead means to maintain relatively constant stroke length of said piston means regardless of said height;

means for generating power from said fluid movement from said piston means.

4,092,829

BALANCED COMPRESSOR

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,452

Int. Cl.[2] F01B 29/10; F02G 1/04

U.S. Cl. 60—517 7 Claims

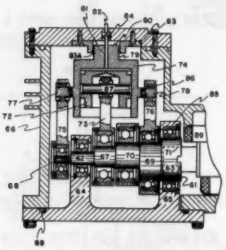
1. In a closed cryogenic cooling system comprising an electric motor driving a compressor which feeds a regenerator through a conduit, the system containing a low molecular weight gas at a minimum pressure orders of magnitude greater than atmospheric pressure; the improvement wherein said compressor comprises:

a crankshaft having at least first and second cylindrical sections with axes parallel to but displaced a short distance

in opposite directions from the axis of rotation in said crankshaft;

a piston and a first rod connected between said piston and said first cylindrical section to provide a displacement thereof equal to twice said short distance associated with said first section;

a hollow cylinder closed at one end snugly and coaxially fitted around said piston to provide a compression chamber therebetween, and at least a second rod connected to said cylinder and said second cylindrical section to produce a displacement of said cylinder which is opposite to that of said piston the weights and displacements of said piston and cylinder being balanced to produce minimum crankshaft vibration;



a housing surrounding said motor crankshaft, piston and cylinder, the walls of said housing being charged with said gas at said minimum pressure and having inward projections providing bearing supports for said crankshaft and a first guide recess to slideably engage the outer surface of said cylinder, thereby restricting it to axial translation only; and

said conduit being sealed through the wall of said housing into said recess and having a telescoping section within said housing communicating with said compression chamber, whereby said gas at high ambient pressure within said housing leaks into said chamber and is forced into said conduit at even higher pressure by the relative motion of said piston and cylinder and any gas leaking through said telescoping section into said recess passes freely back into said housing.

4,092,830

GAS DRIVEN MOTOR WITH BUFFER SPACE

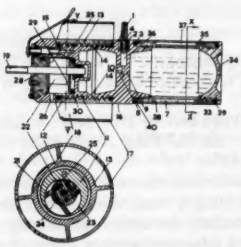
John Walter Rilett, 18 Links View, Stratton, Cirencester, England

Filed Jan. 13, 1977, Ser. No. 759,133

Claims priority, application United Kingdom, Jan. 16, 1976, 1689/76; Jun. 21, 1976, 25600/76

Int. Cl.[2] F01K *25/10*

U.S. Cl. 60—671 **10 Claims**



1. A motor having in combination therewith apparatus for supplying to the motor gas evaporated from liquefied gas, said apparatus comprising a vessel containing liquefied gas, a passage which affords communication between the vessel and the motor whereby gas evaporating from the liquefied gas is conducted into the motor, and in heat conductive relationship with the vessel, at least one container holding a buffer substance which during operation of the motor releases heat to the vessel and the liquefied gas therein, whereby the tendency of the evaporation of the liquefied gas to cool the remaining liquefied gas in the vessel is at least partly counteracted.

4,092,831

ROOF BAR FOR SURFACE SUPPORT ELEMENTS

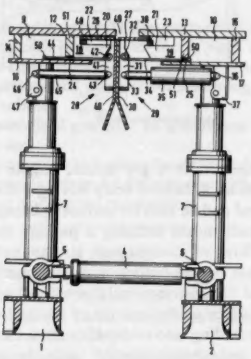
Walter Lubojatsky, Recklinghausen, and Wilhelm Wertelewski, Datteln, both of Germany, assignors to Becorit Grubenausbau GmbH, Recklinghausen, Germany

Filed Jun. 3, 1976, Ser. No. 692,248

Claims priority, application Germany, Jun. 5, 1975, 2525034

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **8 Claims**



1. In an improved roof bar for surface support elements of the type which includes a top plate, an L-shaped gap sealing plate having horizontally-disposed, upper section and a vertically-disposed, lower section which serves as a buffer plate, said gap sealing plate being coupled to at least one side of said roof bar and being displaceable generally toward an adjacent roof bar, a pivotable hydraulic cylinder coupled to said buffer plate and to said roof bar, the improvement comprising:

a first guide element rigidly mounted on said roof bar beneath said top plate thereof, said first guide element defining, in cooperation with said top plate, a horizontally-extending channel therebetween in which said upper horizontally-disposed section of said gap sealing plate is slidably mounted.

4,092,832

METHOD OF CORRECTING THE HEIGHT LEVEL OF A FOUNDATION

Arne J. Mattson, Vesteras, Sweden, assignor to Paul Anderson Industrier AB, Vesteras, Sweden

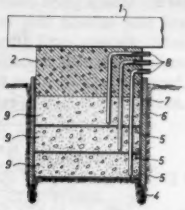
Filed Sep. 7, 1976, Ser. No. 721,030

Int. Cl.[2] E02D *27/48, 5/48*

U.S. Cl. 61—51 **4 Claims**

1. In a method of correcting the height level of a concrete foundation or the like which is supported on a loose soil material, the bearing capacity of which has been locally increased under the foundation by means of an oblong casing open at its opposite ends and driven down into the ground in order to isolate with respect to lateral movements in the soil masses a predetermined soil volume from the surrounding soil, the

improvement comprising the steps of: providing at least one layer of a material having distribution passages beneath the



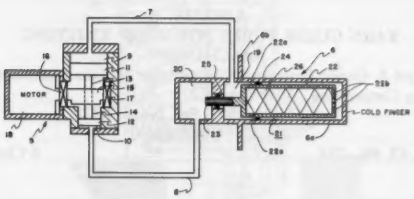
foundation, and injecting a moveable material mass into said layer at a pressure capable of rising the foundation.

4,092,833

SPLIT-PHASE COOLER WITH EXPANSION PISTON MOTION ENHANCER

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1977, Ser. No. 773,033
Int. Cl.² F25B *9/00*
U.S. Cl. 62—6 **3 Claims**



1. A split-cycle mechanical cooler having a compression portion, a distinct expansion portion, and conduit means between said portions: said compression portion including a first piston in a first cylinder and a second piston in a second cylinder, and means for reciprocally moving said pistons in said cylinders in phase opposition; said expansion portion including a third cylinder having distinct first and second spaces, a third piston in said third cylinder having opposite ends respectively in said first and second spaces, and a regenerator in said end of said third cylinder which is in said first space of said third cylinder; and said conduit means including first and second conduits respectively connecting said first cylinder to said first space and said second cylinder to said second space.

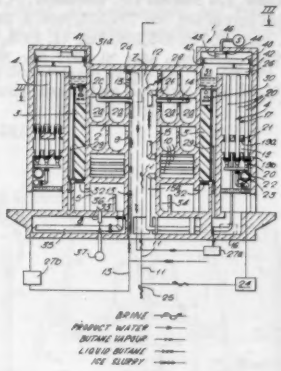
4,092,834

FREEZE SEPARATION PLANT

Albert Ivor Lloyd, Dorset, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 14, 1976, Ser. No. 750,351
Claims priority, application United Kingdom, Jan. 28, 1976, 3417/76
Int. Cl.² B01D *9/04;* C02B *1/12*
U.S. Cl. 62—123 **13 Claims**

1. In a plant for reducing the impurity content of impure water by an immiscible refrigerant-freeze process, the plant including a two stage crystallizer for producing ice crystals in the impure water by boiling the immiscible refrigerant in the impure water in the first stage and disentraining the vapor in the second stage, the improvement wherein the crystallizer first stage is arranged as a number of tiers of passageways and includes means for introducing refrigerant into impure water in the passageways defining each tier, conduit means for leading ice crystal slurry from the first stage to the second stage wherein disentrainment of vapor is effected, and means for



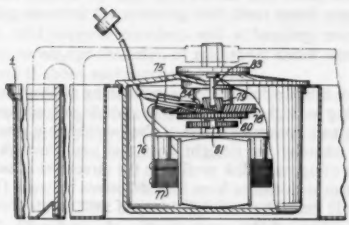
producing water having a reduced impurity content from the ice crystals.

4,092,835

ELECTRICAL APPLIANCE FOR MAKING SORBET

Pierre Tanguy, 30, rue de Dijon, 21000 Daix, and André Faivre, 14, rue Adolphe Dietrich, 21000 Dijon, both of France

Division of Ser. No. 543,798, Jan. 24, 1975, Pat. No. 4,009,588.
This application Aug. 9, 1976, Ser. No. 713,211
Claims priority, application France, Jan. 30, 1974, 74 03045
Int. Cl.² G05D *24/02;* A23G *9/00*
U.S. Cl. 62—136 **4 Claims**



1. In an appliance for making sorbet or ice cream, wherein the appliance has a driving spindle projecting from a gear motor housing to which a rotating arm supporting mixing blades thereon is attached, and wherein said appliance includes means for preventing the mixer blades from becoming locked in ice by effecting a progressive withdrawal of the blades from a vertical orientation towards a horizontal orientation under the action of an opposing torque applied to the blades by the hardening of the ice during freezing, the improvement comprising:

an automatic stopping device including a projection means provided on one of the blades for contacting a lever mounted on the periphery of a cover for the gear motor housing and opposing continued rotation of said arm supporting the blades on completion of the withdrawal of the blades, said projection means causing said lever to pivot when the blade reaches its withdrawn position and a switching means for opening the motor supply circuit responsive to said projection means contacting said cooperating means wherein said switching means is activated by a cam rotated by a spindle mounting said lever on said cover.

4,092,836

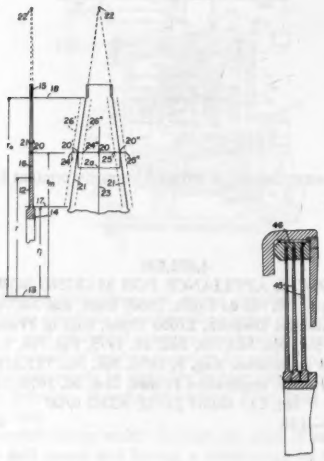
FLEXIBLE-DISK COUPLINGS

Ernest Wildhaber, 124 Summit Dr., Rochester, N.Y. 14620

Continuation-in-part of Ser. No. 739,255, Nov. 5, 1976, Pat. No. 4,079,598, and Ser. No. 695,205, Jun. 11, 1976, Pat. No. 4,044,571. This application May 20, 1977, Ser. No. 798,839

Int. Cl.[2] F16D *3/78*

U.S. Cl. 64—13 **6 Claims**



1. A flexible-disk coupling containing at least one disk decreasing in thickness towards the outside and connected at the inside to a rotary part and at the outside to a mating rotary part, whereby the straight lines that pass through the mean points of opposite disk profiles in the directions of said profiles, intersect at distances from the said points between $(1 + \frac{1}{4})$ and $(1 - \frac{1}{4})$ times the radial distance of said points from the disk axes.

4,092,837

TORSIONAL ISOLATOR COUPLING

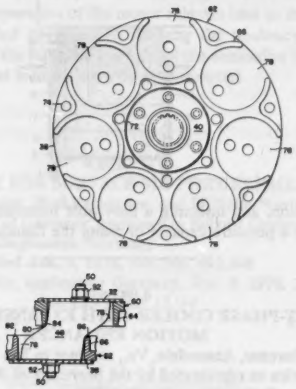
Thomas Edward Gebauer, and Larry Gene McMullen, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 19, 1976, Ser. No. 743,397

Int. Cl.[2] F16D *3/64;* B16D *3/10*

U.S. Cl. 64—27 NM **8 Claims**

1. In a vehicle transmission drive including a flywheel, an input shaft adjacent to and coaxial with the flywheel and a torsional isolator coupling connected between the flywheel and the input shaft, the improvement comprising: said coupling including drive and driven members spaced axially in their entirety from each other and respectively fixed to the flywheel and input shaft for respective rotation therewith; a plurality of yieldable resilient isolator members; and first and second means respectively mounting opposite ends of the isolator members for rotation with the drive and driven members and for free deflection between said opposite ends for yieldably resisting, at a first spring rate, relative rotation between the drive and driven members induced by torque loads below a predetermined torque load; and isolator member snubber means mounted on the drive and driven members in operative association with the isolator members for engaging and supporting the latter between said opposite ends to thereby inhibit said free deflection for increasing the spring rate thereof above



said first rate to a second spring rate only when torque loads above said predetermined torque load are being transferred between the flywheel and input shaft.

4,092,838

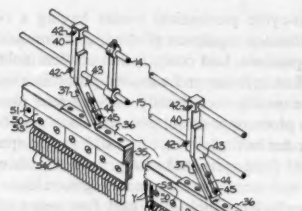
YARN GUIDE TUBES FOR WARP KNITTING MACHINES

Robert J. Gangi, Emerson, N.J., assignor to Joan Manufacturing Corporation, Waldwick, N.J.

Filed Jul. 22, 1977, Ser. No. 817,922

Int. Cl.[2] D04B *23/00*

U.S. Cl. 66—214 **6 Claims**



1. In a knitting machine including a row of needles supported for longitudinal reciprocation, carrier rod means supported for parallel movement relative to said needles, and means for imparting step-by-step racking movement to said carrier rod means, the combination therewith of improved means for feeding inlaying yarns to said needles, said inlaying yarn feeding means comprising

(a) a tube guide support bar extending parallel to said needles,

(b) spaced apart support means for said tube guide support bar, each of said support means including one end fixed on said carrier rod means and an opposite end fixed on said tube guide support bar,

(c) a plurality of profile plates including one face removably secured to said tube guide support bar, and

(d) a plurality of yarn guide tubes including upper end portions fixed to the other face of each of said profile plates and being circular in cross section, said yarn guide tubes

including lower end portions extending downwardly from said profile plates to define free ends for directing inlaying yarns to said needles, the centers of the free ends of adjacent yarn guide tubes being spaced the same distance apart as the spacing of said needles said lower end portions being bent inwardly from opposite sides so that, the free lower ends of adjacent yarn guide tubes are elongated in cross-section and are sufficiently spaced apart to at times permit the needles to pass therebetween.

4,092,839

DEVICE FOR THE WET-TREATMENT OF MOVING WEBS

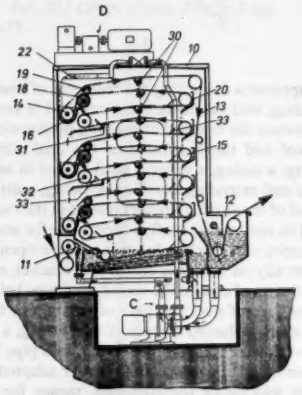
Gerhard Bähre, Bendestorf; Jürgen Brauns, Buchholz (Nordheide), and Willi Struck, Pinneberg, all of Germany, assignors to Artos Dr. Ing. Meier-Windhorst KG, Seevetal, Germany

Filed Aug. 6, 1976, Ser. No. 712,411

Claims priority, application Germany, Aug. 8, 1975, 2535464; Feb. 17, 1976, 2606217

Int. Cl.[2] D06B *3/02, 15/08*

U.S. Cl. 68—19 **9 Claims**



1. In a device for the continuous wet treatment of moving webs and, in particular, the washing and drying of textile webs, of the type including a chamber through which the web passes in a serpentine fashion along substantially horizontal travel paths supported by a plurality of horizontally spaced apart guiding rollers and reversing rollers between which are free, unsupported, horizontally-disposed stretches of the web said guiding rollers being disposed in a vertically-oriented column at one side of the chamber and said reversing rollers being disposed in a vertically oriented column at the other side of the chamber, the improvement comprising:

a first plurality of elongated wipers, each of which is mounted adjacent to one of the reversing rollers and is disposed to engage across the width of the upper surface of the horizontally disposed stretch of web so as to strip excess liquid therefrom and thereby prevent the web from floating on the reversing rollers;

a second plurality of elongated wipers, each of which is mounted adjacent to one of the guiding rollers and is disposed to engage across the width of the upper surface of the horizontally disposed stretch of web so as to strip excess liquid therefrom and thereby prevent the web from floating on the guiding rollers; and

a third plurality of elongated wipers, each of which is mounted adjacent to the middle of one of the free unsupported stretches of the web and is disposed to engage across the width of the lower surface thereof so as to strip liquid therefrom and so as to provide positive guidance and support for the unsupported horizontally-disposed stretch of the web.

4,092,840

DEVICE FOR FLANGING THE EDGES OF SHEET SECTIONS

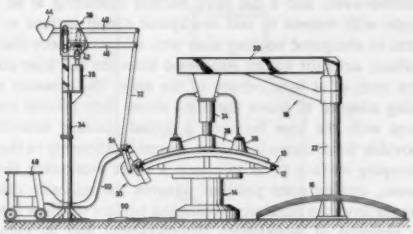
Gerd-Jürgen Eckold, St. Andreasberg, and Hans Maass, Bad Lauterberg, both of Germany, assignors to Paweck AG, Chur, Switzerland

Filed Dec. 10, 1976, Ser. No. 749,401

Claims priority, application Germany, Oct. 21, 1976, 2527225

Int. Cl.[2] B21D *19/08*

U.S. Cl. 72—312 **13 Claims**



1. Apparatus for bending the outer edge of sheet metal members into a predetermined form, comprising:

a yoke substantially having a C-shaped contour in the direction of said edge and extending substantially transverse to said edge on both sides thereof;

a support member for supporting said sheet metal member and being engaged with one of the legs of said yoke, and being adapted to the contour of a sheet metal member and including a tube;

said yoke further including a centering element for engagement with said support member;

a tool carrier mounted on said yoke and movable relative thereto;

tool means carried by said tool carrier and comprising a clamping member for retaining said sheet metal member against said support member, and a bending member adapted to engage the edge of said sheet metal member and bend it about said support member;

reciprocating drive means connected to said yoke for actuating said clamping member and said bending member and to move said tool carrier relative to said support member.

4,092,841

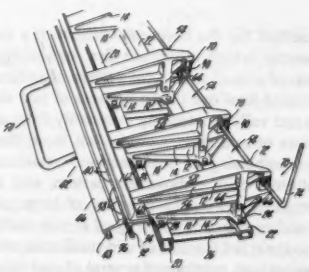
SHEET METAL BRAKE

Clarence G. Chambers, Jr., Birmingham, Mich., assignor to Jayson Corporation, Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,153

Int. Cl.[2] B21D *11/20*

U.S. Cl. 72—320 **6 Claims**



1. A sheet metal brake comprising: a base having an elongated, substantially horizontal, fixed, work clamping surface; a plurality of elongated arms each extending normally to the

length of said fixed work clamping surface; pivot sections fixed to each of the arms near a first end of each arm, extending normally to the arms and being pivotably connected to the base for motion about an axis extending parallel to said fixed work clamping surface and normally to the lengths of said arms; an elongated movable work clamping member fixed to the second end of each of said arms and extending normally to said arms and parallel to said work clamping surface, said clamping member having a flat surface adapted to cooperate with said fixed clamping surface to retain a sheet workpiece therebetween, and a flat anvil surface extending at an acute angle with respect to said workpiece clamp surface so as to form an elongated bending nose with said workpiece clamping surface; actuator means supported between the base and the first ends of at least certain of the arms, the actuator means being adapted to move the arms about their pivotal connections with the base between a closed position wherein the movable work clamp is in close spaced relationship to the fixed clamping surface so as to clamp a sheet workpiece therebetween, and an open position wherein the movable clamp is spaced from the fixed work clamping surface to allow insertion or removal of workpieces therebetween; and an elongated bending arm pivotably supported with respect to the base on an axis extending parallel to the fixed and movable work clamps.

4,092,842

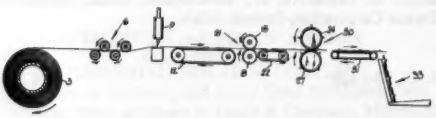
DEEPLY EMBOSSED SHEET PRODUCT AND METHOD AND APPARATUS FOR THE PRODUCTION THEREOF

Nathan Oser, Perrineville, and Edmund John Niedzinski, Somerville, both of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 622,930, Oct. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 521,829, Nov. 7, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,646

Int. Cl.² B21D *13/04*

U.S. Cl. 72—379 **5 Claims**



1. A method for the deep embossment of a single layer of sheet material which comprises first embossing across said sheet material a small scale relief pattern of a plurality of directions across at least one of the surfaces of said sheet material, said hills and valleys extending outwardly from at least one of the surfaces of said sheet material not more than 1 cm, and thereafter embossing in superimposed relationship on said relief pattern a deep embossment pattern, said deep embossment pattern comprising a plurality of large protuberances, each of said protuberances being of a scale sufficiently large relative to the relief features of said small scale relief pattern to encompass at least portions of several of said hills and valleys, said large protuberances being present in a number sufficient to prevent adjacent sheets of said sheet material from touching except at the points of said protuberances when at least two sheets of said sheet material are stacked in vertical array.

4,092,843

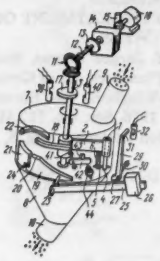
APPARATUS FOR TESTING THE READINESS OF HEAT-TREATED COAL FOR MOULDING

Danil Danilovich Matskevich, prospekt Gagarina, 6 mikroraion, 15, kv. 88; Nina Efimovna Ivashkova, ulitsa Sharikovaya, 51, kv. 2, and Viktor Vasilievich Gavrikov, ulitsa Otakara Yarosha, 15, kv. 49, all of Kharkov, U.S.S.R.

Filed July 19, 1977, Ser. No. 816,944

Int. Cl.² G01N *3/00*

U.S. Cl. 73—17 R **4 Claims**



1. An apparatus for testing the readiness of heat-treated coal for moulding, said readiness being assessed in terms of time as a span between the moment of exerting pressure on a sample of heated coal and the beginning of the coal-sample swelling, comprising: a casing, a vertical shaft placed in said casing and having an end extending outside the casing; a drive connected to said end of the shaft; a bracket placed in the casing and fixed by one of its end on said shaft; a receptacle for accommodating a coal sample, said receptacle being a sleeve open at both ends, fixed vertically on the other end of said bracket; a feed pipe for letting a stream of coal in the casing, said pipe being positioned on the top thereof over the path of rotation of the receptacle with the shaft; a slanted bottom of said casing; a disposal pipe for removing the coal from the casing, said pipe being located on the slanted bottom thereof; a plunger adapted to enter said receptacle and move therethrough; means for moving said plunger in said receptacle during rotation thereof with the shaft to compress the coal sample therein, said means having a first guide member, positioned in said casing along the path of rotation of the receptacle with the plunger so as to be in a horizontal plane at the level of the top end face of the receptacle and to close the entrance passage thereof on the corresponding portion of said path of rotation, said means having a second guide member, placed in said casing on the same portion of the receptacle path of rotation under the first guide member; a weight; a lever system which kinematically connects said second guide member with said weight whereby the second guide member is urged towards the first guide member; said second guide member having an ascending and horizontal parts of the profile of said second guide member used for interaction with the lower end of said plunger as it rotates with the receptacle, whereby the plunger is driven upwards and the coal sample is compressed in the receptacle between the plunger and said first guide member; said means having a third guide member, fixedly positioned in the casing along the subsequent portion of the receptacle path of rotation and having an ascending profile used for interaction with the plunger to cause a further upward movement thereof in the receptacle for the removal of the coal sample therefrom; said means having a fourth guide member fixedly positioned in the casing along the receptacle path of rotation in series with the third guide member and having a descending profile used to interact with said plunger for bringing it into its lowermost position; a means for indicating the beginning of a displacement of the plunger with said second guide member caused by the coal-sample swelling, said indicating means being kinematically connected with said second guide member through said lever system; means for

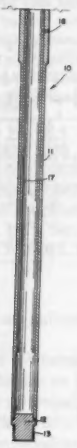
stopping said drive of the shaft rotation when the receptacle comes to a position preceding the intersection of its path of rotation and the stream of coal, and to a position on the horizontal part of the profile of said second guide member; and a means for actuating said drive of the shaft rotation when the coal sample begins swelling.

4,092,844

HYDROGEN PROBE WITH LIMITED ACTIVE AREA

Donald H. Oertle; Richard M. Vennett; Burton M. Casad, and Fred J. Radd, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 20, 1976, Ser. No. 716,321
Int. Cl.[2] G01N *27/46, 27/62, 7/10*
U.S. Cl. 73—23 4 Claims



1. A hydrogen probe device comprising:

an elongated tubular member formed of a hydrogen-permeable metallic material, said member having a first closed end formed of said hydrogen-permeable metallic material and a second open end for connection to a hydrogen-sensing device;

an inner liner in said tubular member, said liner being formed of a hydrogen-impermeable material and extending a part of the length of said tubular member and being sealingly joined at each end to the interior of said tubular member whereby hydrogen permeating the portion of the length thereof between the sealed ends of said liner is prevented from entering the interior of said probe and passing out the open end thereof; and a

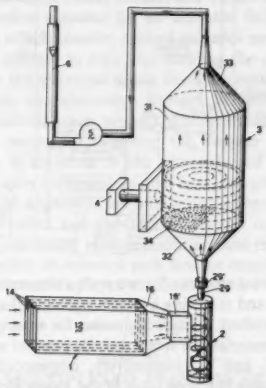
vent means through the wall of said tubular member between the ends of said liner whereby hydrogen which permeates said tubular member between the sealed ends of said liner may pass freely from between the outer surface of said liner and the lined inner surface of said tubular member thereby preventing a buildup of pressure between the interior of the lined portion of said tubular member and the exterior of said liner, the extent of said vent means being from the exterior to the interior of said tubular member.

4,092,845

LUNG SIMULATING AEROSOL SAMPLER

Vittorio Prodi; Carlo Melandri; Giuseppe Tarroni, all of Bologna; Massimo Formignani, Ferrara; Tonino De Zaiacomo, Bologna, and Gianfranco Bompane, San Lazzaro (Bo), all of Italy, assignors to Comitato Nazionale per l'Energia Nucleare — Cnen, Rome, Italy

Filed May 16, 1977, Ser. No. 797,365
Claims priority, application Italy, May 28, 1976, 49698 A/76
Int. Cl.[2] G01N *15/06*
U.S. Cl. 73—28 8 Claims



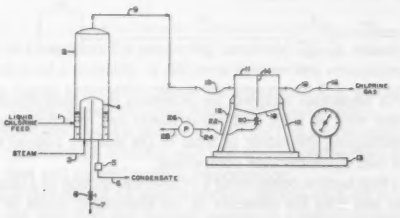
1. An apparatus for simulating the human respiratory tract with respect to the deposition of aerosol particles contained in the breathed air which apparatus comprises an enclosed duct along which the following means are included in the order: a humidifying and particle catching means; a cyclone; a bubbler and a vacuum pump.

4,092,846

DETECTION OF LIQUID IN A GAS STREAM

Thomas C. Jeffery, Lake Charles, La., and Wilmer B. Graybill, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 523,777, Nov. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 256,081, May 23, 1972, abandoned. This application Feb. 4, 1976, Ser. No. 655,187
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—29 9 Claims



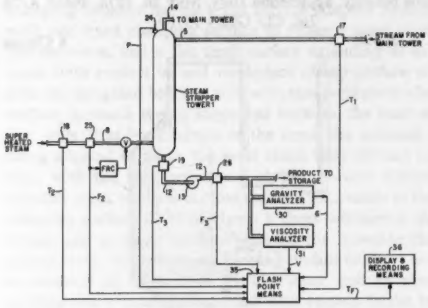
7. An apparatus for vaporizing a liquid comprising a vaporizer means to which that liquid is fed and means for supplying heat to said vaporizer means, the combination therewith of apparatus for producing a substantially liquid-free vapor stream comprising a vessel, a line feeding fluid to said vessel, a line for removing vapor from said vessel, means within said vessel for segregating liquid from vapor, and means for determining the weight for said vessel.

4,092,847

FLASH POINT ANALYZING MEANS AND METHOD

Charles R. Lynch, Port Neches, and Robert A. Wheeler, Beaumont, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,513
Int. Cl.[2] G01N *25/52*
U.S. Cl. 73—36 **24 Claims**



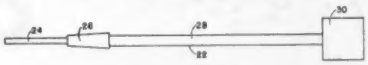
1. A flash point analyzer for use with a steam stripper having a bottom tray and receiving a stream of material and steam and providing a product, comprising means for sensing the temperatures of the material, the steam and the product and providing signals T_1, T_2 and T_3, respectively, corresponding thereto; means for sensing the flow rates of the steam and the product and providing corresponding signals F_2 and F_3, respectively, corresponding thereto; means for sensing a pressure in the stripper and providing a signal P representative thereof; means for sampling the product and providing signals corresponding to at least two predetermined parameters of the product; and means connected to all the sensing means and to the sampling means for providing a signal corresponding to the flash point temperature of the product in accordance with the temperature signals T_1, T_2 and T_3, the flow rate signals F_2 and F_3, the pressure signal P and the parameter signals.

4,092,848

METHOD AND APPARATUS FOR DETERMINING HYDROCYCLONE INTERIOR WEAR

David Charles Thomas, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 5, 1977, Ser. No. 794,213
Int. Cl.[2] G01N *17/00*
U.S. Cl. 73—86 **4 Claims**



1. An apparatus adapted for insertion in a hydrocyclone provided with an inlet, underflow outlet and overflow outlet for determining the extent of wear of the interior conical section of said hydrocyclone comprising:

(1) a first section comprising a cylindrical section of a diameter less than the diameter of the underflow outlet of the hydrocyclone;

(2) a second section connected to the first section comprising a truncated conical section possessing an angle of taper equal to the angle of the interior conical section of the hydrocyclone and of such a diameter as to contact the lower section of the interior conical section upon insertion therein;

(3) a third section connected to the second section comprising a cylindrical section of a diameter less than the largest diameter of the second section; and

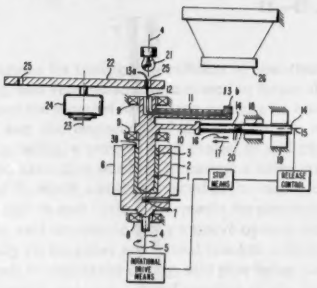
(4) a fourth section connected to the third section comprising a handle.

4,092,849

METHOD AND APPARATUS FOR MEASURING MELT ELASTICITY OF POLYMERS

Bryce Maxwell, 19 McCosh Cir., Princeton, N.J. 08540

Filed May 27, 1977, Ser. No. 801,189
Int. Cl.[2] G01N *3/24*
U.S. Cl. 73—101 **17 Claims**



1. An apparatus for measuring elastic properties of polymers comprising:

(a) a first member mounted for low friction rotation, said first member defining an axis of rotation;

(b) a second member mounted for low friction rotation about said axis of rotation and positioned adjacent said first member to define therebetween an intervening space to receive therein a specimen of polymer to be tested;

(c) means to rotationally drive said first member about said axis of rotation to allow relative rotational movement between said first member and said second member to cause shearing of the specimen positioned therebetween in said intervening space;

(d) releasable retaining means to selectively prevent rotation of said second member;

(e) stop means to selectively halt operation of said rotational drive means and to stop rotation of said first member;

(f) a light source directed along said axis of rotation;

(g) an optical fiber means within said second member to rotate therewith, said optical fiber means including a first end oriented along said axis of rotation and a second end distant from said axis of rotation and parallel with respect thereto, said optical fiber means adapted to transmit light from said first end to said second end;

(h) light interrupting means located in the light flow path between said light source and said first end of said optical fiber means to intermittently block at a known frequency the light from said light source from entering said first end of said optical fiber means; and

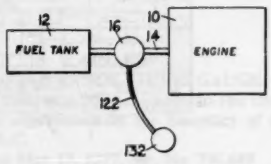
(i) recording means for recording the movement of said second end of said optical fiber means and, hence, the rotation of said second member by recording the light emitted from said second end of said optical fiber means.

4,092,850

FUEL MEASURING AND RECORDING SYSTEMS FOR COMBUSTION DEVICES AND METHOD FOR MONITORING FUEL FLOW

Curtis L. Erwin, Jr., 5805 SE. Gladstone, Portland, Oreg. 97206

Division of Ser. No. 456,264, March 29, 1974, Pat. No. 3,949,602. This application Mar. 2, 1976, Ser. No. 663,049
The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl.[2] G01F *9/00*
U.S. Cl. 73—113 **27 Claims**



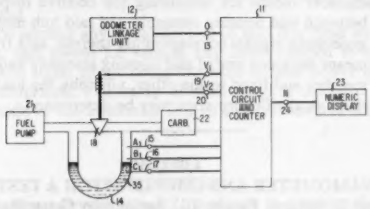
17. A fuel measuring system in combination with an engine, fuel supply means for said engine, slow flow type volumetric measuring means measuring fuel flow in said measuring system, compensating means in said system arranged to compensate the measurement of said measuring means due to variations in the specific gravity of the fuel, and recording means arranged to make a record of a compensated amount of fuel flowing through said measuring means.

4,092,851

APPARATUS FOR THE MEASUREMENT OF VEHICLE FUEL CONSUMPTION

Klaus Andres, 207 Dogwood La., Berkeley Heights, N.J. 07922

Filed Jun. 14, 1976, Ser. No. 695,839
Int. Cl.[2] G01L *3/00*
U.S. Cl. 73—114 **9 Claims**



1. Vehicle fuel consumption rate measurement apparatus comprising control circuitry, an odometer linkage unit, electrically connected to the control circuitry, a fuel flow sensor unit electrically connected to the control circuitry, and a numeric display electrically connected to the control circuitry wherein

(a) the odometer linkage unit includes means for producing an electrical pulse train, in which the number of pulses is related to the distance traveled by the vehicle, to drive a counter in the control circuitry;

(b) the fuel sensor unit includes a fuel input port and a fuel output port with an upper fuel path and a lower fuel path therebetween, the upper fuel path including an electrically actuated valve which is adapted for being switched by the control circuitry to an open position and a closed position, and the lower fuel path including an input column and an output column extending downward of the upper fuel path on either side of the valve, the output column including a lower electrical contact, a center electrical contact and an upper electrical contact, the lower fuel path containing a body of electrolyte, which electrolyte is denser than the fuel and not miscible with the fuel, which said electrolyte is included in sufficient quantity to fill the input and output columns to a level between the lower contact and the center contact;

(c) the numeric display is adapted for being activated by the control circuitry to indicate fuel consumption; and

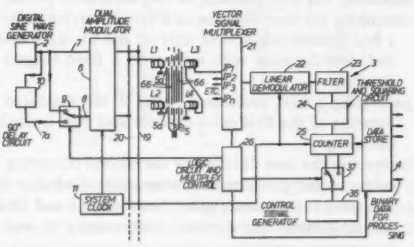
(d) the control circuitry includes a valve actuator, electrically connected to the upper contact and the lower contact, for opening the valve during a preselected recovery and readout time interval, which is initiated when the electrolyte bridges between the upper contact and the lower contact, a counter, a counter control electrically connected to the center contact and the lower contact and to the valve actuator by an actuator link and to the counter, which counter control includes means for resetting the counter to zero and enabling the counter to respond to the electrical signal from the odometer linkage unit when the electrolye bridges between the center contact and the lower contact, which counter control also includes means for disabling the counter from further response at the start of the recovery and readout time interval upon receiving a signal from the actuator link; in which said apparatus the number of pulses per unit distance travelled and the volume of the output column between the center electrical contact and the upper electrical contact are selected such that the count registered in the counter and displayed on the display is a direct reading of the fuel consumption rate.

4,092,852

MULTIPLEXED TRANSDUCER

Albert Lewis Fowler, Kirkcaldry; David Martin Walker, Freuchie; Alastair Kershaw Stevenson, Glenrothes, and Alan Graham Henderson, Markinch, all of Scotland, assignors to Hughes Microelectronics Limited, Glenrothes, Scotland

Filed Mar. 21, 1977, Ser. No. 779,587
Claims priority, application United Kingdom, Mar. 23, 1976, 11725/76; Apr. 30, 1976, 17857/76; Nov. 16, 1976, 47754/76
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **29 Claims**



1. A transducer for producing electrical signals which are a function of a plurality of different parameters, comprising

(a) signal generating means for generating first and second signals having the same frequency characteristic;

(b) control means arranged to provide first and second phase relationships between said first and second signals during first and second periods respectively;

(c) a plurality of parameter sensing devices each for combining said first and second signals in relative proportions dependent upon the value of one of said parameters so as to derive a sum signal of said first and second signals;

(d) sum signal selecting means arranged to select sequentially sum signals from said plurality of parameter sensing devices, and

(e) means responsive to the sum signal from said selecting means and arranged to produce a phase measurement signal which is indicative of the difference in phase of the selected sum signal developed during said first and second

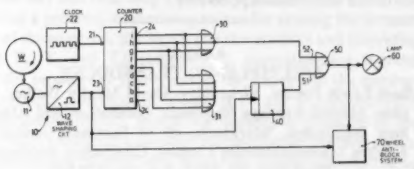
periods, whereby to derive sequentially a plurality of output signals each indicative of one of said parameters.

4,092,853

TESTING ROTARY MOVEMENT-ELECTRICAL SIGNAL TRANSDUCER SYSTEM, PARTICULARLY FOR VEHICLE WHEEL ANTI-BLOCK TRANSDUCER SYSTEMS

Erich Schneider, Kirchheim; Eberhard Schnaibel, Hemmingen, and Helmut Fleischer, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 18, 1976, Ser. No. 733,125
Claims priority, application Germany, Oct. 25, 1975, 2547869
Int. Cl.[2] B60T *17/22*
U.S. Cl. 73—121 7 Claims



1. Method of testing a rotary movement — electrical signal transducer system providing pulses in synchronism with rotation of a rotary device having widely varying speeds, such as the wheel of an automotive vehicle, comprising the steps of

measuring the time duration of two successive pulses;

comparing the time duration of a first occurring pulse with a first predetermined time interval and having a first limited time duration with respect to a fixed longest time interval;

generating a first evaluation signal if the measured time duration of the first pulse exceeds said first limited time duration;

comparing the time duration of the second occurring pulse with a second predetermined time interval which is longer than said first predetermined time interval and having a second limited time duration with respect to said fixed longest time interval;

generating a second evaluation signal and forming a preliminary error, or malfunction signal if the measured time duration of the second occurring pulse exceeds said second limited time duration;

logically combining said first and second evaluation signals and

(a) inhibiting generation of the preliminary error signal if the first pulse is shorter than the first interval, and the second pulse is shorter than the second interval; (b) inhibiting transmission of the preliminary error signal if

the first pulse is longer than said first interval;

the first pulse is longer than the first interval and the second pulse is also longer than said second interval, indicative of deceleration of the wheel; and

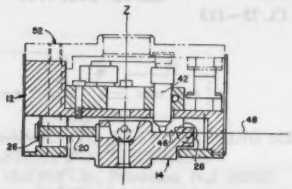
(c) transmitting said preliminary error signal if the first pulse is shorter than said first predetermined interval and the second pulse is longer than said second predetermined time interval.

4,092,854

MULTI-AXIS LOAD CELL

James L. Henry, and Carl F. Ruoff, Jr., both of Dayton, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 615,852, Sep. 23, 1975, abandoned.
This application Apr. 20, 1977, Ser. No. 789,032
Int. Cl.[2] G01L *5/16*
U.S. Cl. 73—133 R 8 Claims



1. A multi-axis load cell comprising:

a housing assembly;

a hub member disposed in said housing assembly;

means for drivingly connecting said housing assembly and said hub member for relative displacement therebetween, said means including a plurality of flexure arms extending between said housing assembly and said hub member, said means including means fixing each of said flexure arms at one end to one of said housing assembly and said hub member;

said means drivingly connecting said housing assembly and said hub member also including flexure means mounting each of said flexure arms to the other of said housing assembly and said hub member, said flexure means readily deflecting to allow relative movement between each flexure arm and said other of said housing assembly or said hub member in a direction along the respective axis of each flexure arm while providing substantially greater resistance to relative movement in other directions; and

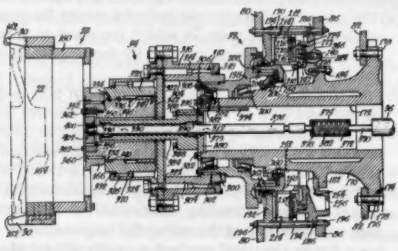
transducer means for measuring the relative displacement between said housing assembly and said hub member and generating signals corresponding thereto, said transducer means engaging one of said housing assembly and said hub member and fixed to the other, whereby the load exerted through the flexure arms may be determined.

4,092,855

DYNAMOMETER AND COUPLING FOR A TEST STAND

Lionel L. Kinney, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 28, 1977, Ser. No. 763,316
Int. Cl.[2] G01L *3/16*
U.S. Cl. 73—134 15 Claims



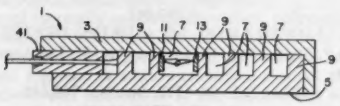
1. A dynamometer comprising:

a base;

a housing mounted on said base for rotation about an axis,

said housing including first and second parts relatively rotatable about said axis and defining a chamber;
interleaved brake discs defining a brake pack within said chamber, some of said discs carried by said first housing part and others carried by said second housing part;
a hydraulic piston within said chamber for compressing said pack;
axially directed coolant inlet and outlet ports in said housing and communicating with said chamber;
a transducer connected to one of said housing parts and to said base; and
a rotatable chuck drivingly connected to the other of said housing parts.

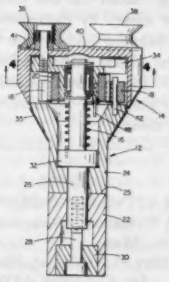
4,092,856
KILOBAR RANGE STRESS GAUGE
Richard Kanda, Vicksburg, Miss., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 13, 1977, Ser. No. 796,649
Int. Cl.[2] G01L *7/02*
U.S. Cl. 73—141 A **9 Claims**



1. A free field stress gauge for use in stress fields up to and including the kilobar range, comprising:
an active disc having a plurality of elements, the density and modulus of said free field stress gauge being dependent upon the number of said plurality of elements and the material used to construct said free field stress gauge, said plurality of elements comprising a plurality of rings formed in one surface of said active disc, said plurality of rings being formed by cutting a plurality of grooves in one surface of said active disc;
a cover disc secured to said active disc to cover said active disc; and
means for sensing any stress applied to said free field stress gauge, said means for sensing any stress applied to said free field stress gauge being mounted on said active disc and comprising a plurality of strain sensors mounted on the inside of the innermost ring of said plurality of rings.

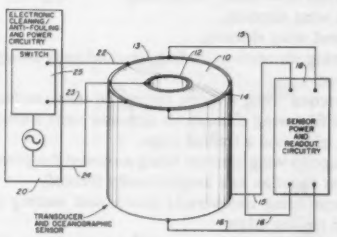
4,092,857
TENSIOMETER
John B. Lawson, Providence, R.I., assignor to Lawson-Hemphill, Inc., Central Falls, R.I.
Filed Jul. 5, 1977, Ser. No. 812,561
Int. Cl.[2] G01L *5/06*
U.S. Cl. 73—144 **1 Claim**

1. A rotating head tensiometer adapted for measurement of the tension on a running yarn, which comprises:
a handle,
a measuring head rotatably mounted on said handle and provided with walls surrounding an enclosure facing said handle;
a beam carried in said enclosure for rotation with said measuring head relative to said handle,
a pair of rollers rotatably mounted on said beam above said walls for rotation of said beam an amount proportional to yarn tension,
a toothed wheel carried by said beam therearound for rotation therewith, and
a plurality of escapements mounted therearound for oscillation about axes parallel to the axis of relative rotation of said handle and said measuring head,
each of the escapement axes being coincident with the center of inertia of the respective escapement,
each of said escapements being heavy, elongated, and having a pair of protuberances engaging the toothed surface of said toothed wheel, whereby moment of inertia is high even at low rates of head rotation and no



weight bias of the heavy escapements tend to change the tension reading at whatever angle said tensiometer is held.

4,092,858
OCEANOGRAPHIC SENSOR WITH IN-SITU CLEANING AND BIO-FOULING PREVENTION SYSTEM
Gene A. Edgerton, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Continuation-in-part of Ser. No. 635,552, Nov. 26, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,578
Int. Cl.[2] G01R *3/00*
U.S. Cl. 73—170 A **17 Claims**


ELECTRONIC CLEANING / ANTI-FOULING AND POWER CIRCUITRY
SWITCH
SENSOR POWER AND READOUT CIRCUITRY
TRANSDUCER AND OCEANOGRAPHIC SENSOR

1. An oceanographic sensor system having the capability of both self-cleaning and bio-fouling prevention simultaneously while operating in a sensor mode while submerged, for removal of foreign materials thereon and the prevention of fouling thereof, comprising:
a. a transducer substrate element of suitable crystal substance and shape operable to be vibrated at or near a resonant frequency at various energy levels;
b. a plurality of separate sensor means fabricated on surfaces of said transducer substrate element as an integral part thereof;
c. at least two of said sensor means being on opposite sides of said transducer element;
d. said sensor means being electrically connected to sensor readout means;
e. an electrical means for providing an alternating electrical potential to vibrate said transducer element while said sensor means is operating in a sensor mode; means for connecting any of the sensor means on one side of the transducer element to one side of said electrical means and any of the conductive coatings on the opposite side of said transducer element to the opposite side of said power source for exciting the transducer substrate element to

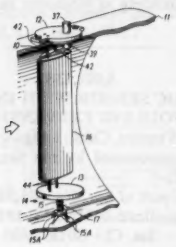
cause vibration thereof at desired frequencies to generate sonic energy which varies in energy intensity from levels which create acoustic streaming forces to intensities which cause cavitation forces to cause removal of any foreign fouling matter on the transducer element and integral sensor means by cavitation of the surrounding water and to prevent fouling due to marine organisms adhering to the sensor surface by acoustic streaming of water adjacent the surface thereof concurrently while oceanographic parameter measurements are being made by said sensor means.

4,092,859

OSCILLATING WING FLOWMETER

Joseph P. DeCarlo, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed May 31, 1977, Ser. No. 801,955
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—194 B **10 Claims**



1. A fluid flow meter comprising:
a first wing element;
a second wing element;
said wing elements extending longitudinally alongside each other;
said second wing element having an inner surface toward said first wing element, an opposite outer surface, a leading edge, and a trailing edge;
said second wing element being mounted for pivotal movement about an axis longitudinally thereof;
said axis being transversely nearer said leading edge than said trailing edge;
whereby said second wing oscillates at a frequency proportional to flow rate.

4,092,860

LEVEL MEASUREMENT AND CONTROL

Matheus Gijsbertus Jozef Arts, Burgemeester Mollaan 5, Waalre; Jozef Augustinus Elisabeth Spaan, Esdoornstraat 2, Nuenen; Antonius Gerardus Martinus v. Asseldonk, Outshoornstraat 33, and Johannes Augustinus Catharinus Maria de Maat, Cassandraplein 19, both of Eindhoven, all of Netherlands

Filed Oct. 14, 1975, Ser. No. 622,398
Claims priority, application Netherlands, Oct. 14, 1974, 7413475
Int. Cl.[2] G01F *23/24*
U.S. Cl. 73—304 R **10 Claims**

1. A method of measuring the level of a fluid or other suitable substance contained in a container, comprising the steps of: immersing a detector including at least two electrodes insulated from said fluid or substance in said fluid or substance, coupling said electrodes to a high-frequency voltage supply, and measuring the conductivity of said fluid or substance between said electrodes at a frequency such that the capacitance between each electrode and said fluid or substance is negligible, the impedance of said fluid or substance between said electrodes being indicative of the level of said fluid or

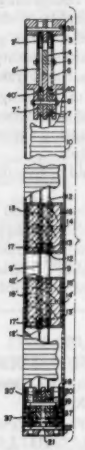
substance, the capacitive component of said impedance being negligible at the frequency of said voltage supply.

4,092,861

LIQUID LEVEL MEASURING DEVICE

William F. Fling, 351 S. Fuller Ave., Apt. 35, Los Angeles, Calif. 90036

Filed Feb. 14, 1977, Ser. No. 768,642
Int. Cl.[2] G01F *23/06*
U.S. Cl. 73—311 **11 Claims**

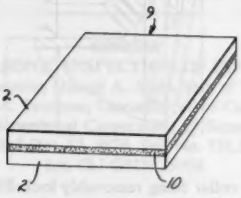


1. A liquid level measuring device for simultaneously measuring the liquid levels of two liquids in a container, said device comprising:
(a) an elongated frame insertable into the liquids in said container;
(b) two floats of different buoyancies;
(c) means for mounting said floats so that each float is movable along said frame by the buoyant forces of the respective liquids; said mounting means comprising two endless guide cables, means for mounting each guide cable on said frame for independent movement relative to said frame, and means for mounting each float on a respective endless guide cable;
(d) manually operable means for selectively holding said floats in a fixed position relative to said frame; said holding means being mounted adjacent one end of said frame for engaging each endless guide cable to hold the same in a fixed position relative to said frame.

4,092,862
THERMAL GRADIENT TEMPERATURE SENSOR

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Continuation of Ser. No. 467,015, May 4, 1976, abandoned. This application May 24, 1976, Ser. No. 689,133
Int. Cl.[2] G01B 7/16
U.S. Cl. 73—362 CP 10 Claims



1. A temperature sensor for placement in thermal contact with an object for providing a detection of the thermal gradient of the object, which sensor comprises:

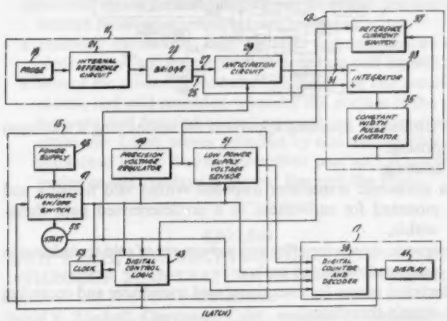
a layer of thermally sensitive, compliant, polymeric, poled, electrically nonconductive pyroelectric material comprising two uniformly poled pyroelectric sheets adhesively joined together in surface-to-surface contact to form a relatively stiff midsection in said layer about which the sheets of said layer bend; and

an electrically and thermally conductive layer carried on not more than one broad surface of said layer for placement in surface-to-surface contact with at least a portion of said object, said pyroelectric layer producing an electrostatic charge pattern on its surfaces which varies in accordance with the thermal gradient of the portion of the object that said conductive layer contacts.

4,092,863
ELECTRONIC THERMOMETER CIRCUIT

Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 12, 1977, Ser. No. 758,630
Int. Cl.[2] G01K 7/24
U.S. Cl. 73—362 AR 8 Claims



1. An electronic thermometer system comprising: a temperature sensing circuit for providing an analog signal representative of a temperature being sensed, said temperature sensing circuit including a temperature sensing probe, a bridge circuit connected thereto, and an anticipation circuit means connected to the output of said bridge circuit, said anticipation circuit means including (i) means for providing a first output signal representative of a reference temperature signal, and (ii) means for generating a second output signal having seriate first and second portions, said first portion being representative of said sensing probe heat transfer response curve, and said second portion being a further scaled representation of said first portion, said means for generating including means for developing said second portion by scaled combination of respective first and second components, said first component involving a first multiplication scale factor and said second component involving a second multiplication scale factor, said means for developing applying said scale factors to respectively associated representations of said response curve;

a voltage to rate converter circuit responsive to said first and second output signals from said anticipation circuit for providing constant width and amplitude pulses proportional to the temperature being sensed;

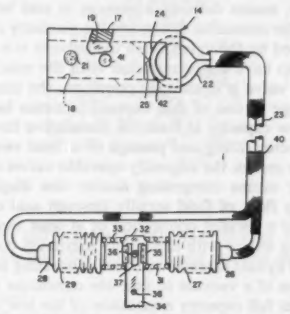
a power and control circuit connected to said temperature sensing circuit and to said voltage to rate converter so as to control their operation; and

a counting circuit having a display driven by a digital counter and decoder for displaying the temperature being sensed, said counting circuit being connected to said voltage to rate converter through said power and control circuit.

4,092,864
HOT SPOT THERMOMETER

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,538
Int. Cl.[2] G01K 5/48
U.S. Cl. 73—363 6 Claims



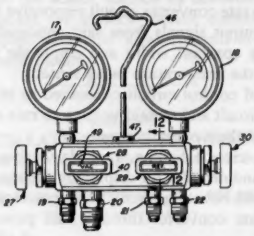
1. The combination comprising an electrical transformer apparatus having a tank containing cooling oil in which the coils of a transformer winding are immersed, and a hot spot thermometer unit having a ceramic body inserted into a space between the coils, a flexible tubing filled with fluid, a bellows connected to each of the ends of the tubing adapted to cause the fluid to oscillate about the tubing accordingly as one or the other of the bellows is actuated, a rocker arm cooperable with the bellows to alternately actuate one and then the other of the bellows, a loop formation in the tubing disposed in a recess in the body, a heat sensitive element arranged in the recess having a tapered end abutting the loop, the heat sensitive element adapted upon sensing a predetermined rise in temperature to expand its tapered end into squeezing relation with the tubing and causing as a consequence a restriction in the flow of the fluid in the tubing and a corresponding loading of the rocker arm.

4,092,865

FLUID-TEST APPARATUS

Richard V. Strybel, Elk Grove Village, Ill., assignor to Gould Inc., Cleveland, Ohio

Filed Jun. 24, 1976, Ser. No. 699,537
Int. Cl.[2] G01L 7/00
U.S. Cl. 73—756 6 Claims



1. In a fluid-test apparatus such as for use in testing a refrigeration system having a high pressure side and a low pressure side, said apparatus having a body defining a manifold chamber, the improvement comprising: first connector means having a first manually operable valve for selectively providing a first fluid communication through said body to said manifold chamber; second connector means having a second manually operable valve for selectively providing a second fluid communication through said body to said manifold chamber; third connector means having a third manually operable valve for selectively providing a third fluid communication through said body to said manifold chamber; fourth connector means having a fourth fluid communication through said body to said manifold chamber; and gauge means for indicating a fluid condition communicating with said manifold chamber, each of said connector means including a connector fitting secured to said body, means defining a passage in said body extending between the connector fitting and the manually operable valve to be closed by the valve when the valve is in a closed condition and to have communication with the manifold chamber when the valve is in an open condition, the connector fitting and passage of one of said connector means having a preselected flow capacity at least the cumulative flow capacity of the connector fitting and passage of at least two of the other connector means, the manually operable valves of each of said connector means comprising similar size diaphragm valves permitting flow of fluid serially through said one connector means and a parallel connection of at least two of the other connecting means with effectively maximum cumulative flow permitted by said at least two other connecting means whereby application of a vacuum to said one connector means permits concurrent full capacity evacuation of the low and high sides of the refrigeration system through two of the other connector means respectively.

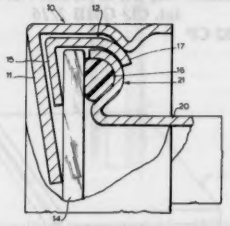
4,092,866

PRESSURE GAUGE CASE

Raymond D. Miele, Jr., Springfield, N.J., and Roy E. Watson, Marshalltown, Iowa, assignors to Eltra Corporation, Toledo, Ohio

Filed Mar. 14, 1977, Ser. No. 777,209
Int. Cl.[2] G01D 11/26; G04B 39/00
U.S. Cl. 73—431 6 Claims

1. An instrument case comprising:
a container having at least one open end,
a window,
an arcuately shaped flange on the peripheral edge of the open end
an expandable split collar having end portions formed to receive the peripheral edge of said flange and the peripheral edge of said window,
a ring which snaps in place around said collar and causes it to contract,
said end portion resiliently pressing said window against at least a portion of said flange when contracted, and



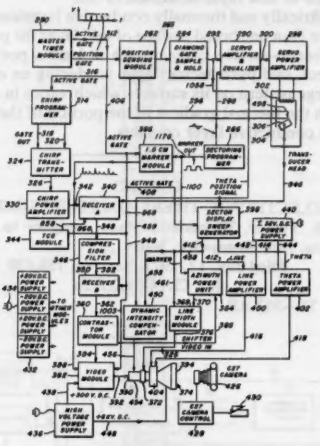
said ring and collar being removably locked in place on the container when said ring snaps in place.

4,092,867

ULTRASONIC SCANNING APPARATUS

Terrance Matzuk, 154 Eileen Dr., Pittsburgh, Pa. 15214

Filed Feb. 10, 1977, Ser. No. 767,376
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—609 46 Claims



1. Ultrasonic scanning apparatus for insonifying a specimen comprising:
a housing,
an ultrasonic transducer disposed within said housing and mounted for movement in a predetermined path therewithin,
magnetic means for effecting movement of said transducer in said predetermined path,
electrical means for energizing said transducer and receiving signals therefrom,
said magnetic means including permanent magnet means and electromagnetic means,
energizing means for electrically energizing said electromagnetic means,
position sensing means for determining the position of said transducer within said predetermined path,
said position sensing means being disposed out of direct physical contact with said specimen, and
signal processing means for comparing a position signal from said position sensing means and another signal which indicates a desired position of said transducer and emitting

a position correcting signal if a difference in said signals exists, whereby

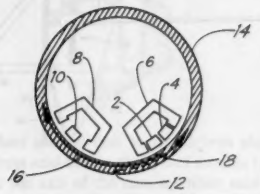
said transducer may be moved in a continuously controlled manner in said predetermined path within said housing independently of the position or movement of said housing with automatic correction for departures of said transducer from a desired position on said predetermined path, by position sensing means disposed out of direct physical contact with said specimen and cooperating with said signal processing means.

4,092,868

ULTRASONIC INSPECTION OF PIPELINES

Robert B. Thompson; George A. Alers, both of Thousand Oaks, and Marion A. Tennison, Camarillo, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 12, 1976, Ser. No. 731,199
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—638 **7 Claims**



1. An inspection station for a pipe comprising:

a moveable carriage positionable inside the pipe;

means for moving said carriage through the pipe;

a first magnet mounted on said carriage so that the poles of said magnet are spaced apart, close to the inside surface of the pipe when said carriage is positioned within the pipe;

an ultrasonic Lamb wave transmitter coil and a first receiver coil mounted between said poles;

a second magnet mounted on said carriage a predetermined distance from said first magnet;

a second receiver coil mounted between the poles of said second magnet;

electronic means for driving said transmitter carried by said carriage;

electronic means for receiving signals from said first and said second receivers carried by said carriage;

a recorder carried by said carriage and coupled to said electronic receiving means for recording said signals; and

a battery for powering said electronic driving and receiving means, and said recorder, whereby the portion of the pipe between said first and second magnets can be inspected by ultrasonic Lamb waves reflected by non-uniformities and ultrasonic Lamb waves transmitted past said non-uniformities as said carriage is moved through the pipe.

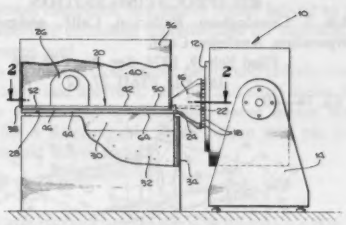
4,092,869

SLIP PLATE ASSEMBLY FOR VIBRATION TESTING THROUGH TEMPERATURE EXTREME THERMAL CYCLING

David V. Kimball, Claremont, Calif., assignor to Kimball Industries, Inc., Monrovia, Calif.

Filed May 9, 1977, Ser. No. 795,183
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **15 Claims**

1. A slip plate assembly for shaker-head generated vibration testing of a test piece being exposed to thermal cycling between preselected test temperature extremes in a closed environment, said assembly comprising: spaced, generally parallel and congruent plate elements including a first plate element beyond said closed environment for coupling of the assembly to said shaker head, and a test piece-carrying, test temperature dimensionally-responsive second plate element adapted to be exposed in said closed environment; and pin means defining a



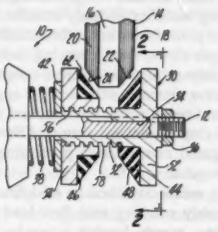
singular locus of vibration transmitting connection of said first plate element to said second plate element in dimensionally temperature responsive relation.

4,092,870

ENGINE STARTING MECHANISM

Paul Francis Giometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Aug. 30, 1976, Ser. No. 718,510
Int. Cl.[2] F02N *11/00*; F16D *13/28, 43/20*
U.S. Cl. 74—7 R **6 Claims**



1. An engine starting mechanism for rotating an engine mounted disc having opposed faces, said starting mechanism comprising:

a starter motor;

a starter shaft selectively rotated by the starter motor;

a sleeve member surrounding the starter shaft;

means acting between the starter shaft and sleeve member to rotate the sleeve member with the starter shaft and permit axial movement of the sleeve member relative to the starter shaft;

an inertia member surrounding the sleeve member;

first and second annular frictional gripping members respectively mounted on the sleeve member and the inertia member and adapted for engagement with the opposed faces of the engine mounted disc;

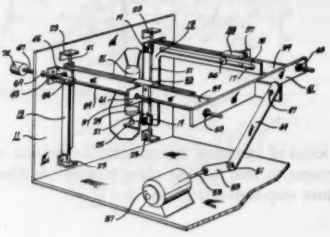
and helical means mounting the inertia member on the sleeve member so that upon initiation of rotation of the starter shaft the inertia member is moved axially of the sleeve member to carry the second frictional gripping member toward the first frictional gripping member whereby the opposed faces of the disc are drivingly engaged by the frictional gripping members to rotate the disc with the starter shaft.

4,092,871

PRECISION DRIVE MECHANISM FOR CONVERTING FIXED RECIPROCATING MOTION TO ADJUSTABLE RECIPROCATING MOTION

Patrick J. Cunningham, Fullerton, Calif., assignor to Dyne Corporation, Anaheim, Calif.

Filed Feb. 9, 1976, Ser. No. 656,406
Int. Cl.[2] F16H *21/32*
U.S. Cl. 74—40 6 Claims



1. Precision drive mechanism for converting fixed arcuate reciprocating motion into adjustable reciprocating rectilinear motion, comprising:

a base member adapted to receive a drive plate in slidable connection therewith;

a first drive plate having an elongated slot therein, said drive plate being slidably attached to said base member to provide rectilinear motion of said drive plate with respect to said base member;

a first pivot frame having an elongated arm of which one end is pivotally attached to said base member, the other end of said elongated arm being adapted to be connected to a source of fixed arcuate reciprocating motion;

a first bearing member slidably attached to said elongated arm of said pivot frame and substantially movable over the entire length thereof, said bearing member being adapted to threadably engage lead screw means;

first lead screw means for threadably engaging said bearing member and being rotatably attached to said pivot frame, said lead screw means moving said bearing member along said elongated arm of said pivot frame when said lead screw is rotated;

First turning means attached to said first lead screw means for adjustably rotating said first lead screw means, said first turning means having a projecting pin extending radially outward from said first lead screw means adjacent the end of said first lead screw means, a drive shaft rotatably mounted to said base member and having one end adapted to be turned with the other end thereof having a projecting pin extending radially outward therefrom, and a hollow cylindrical connector having two ends with each end having at least one longitudinal slot therein where one end of said hollow cylindrical connector is in sliding movable contact over the end of said first lead screw means with said at least one longitudinal slot engaging said projecting pin therein and the other end of said hollow cylindrical connector is in sliding movable contact over said other end of said drive shaft with said at least one longitudinal slot engaging said projecting pin of said drive shaft whereby said first lead screw means can pivot in reciprocating angular motion with respect to said drive shaft and said drive shaft can be turned to rotate said first lead screw means; and

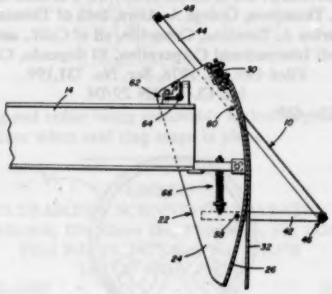
first connecting means fixedly attached to said first bearing member for slidably connecting said first drive plate through said elongated slot to said first bearing member whereby said first drive plate is moved in reciprocating rectilinear motion with respect to said base member by said first pivot frame when said other end of said elongated arm of said first pivot frame is connected to a source of fixed arcuate reciprocating motion, the magnitude of the reciprocating motion of said first drive plate being adjustable by moving said first bearing member along said elongated arm of said first pivot frame by rotating said first lead screw means.

4,092,872

SAFETY ATTACHMENT FOR THE HORSEHEAD OF AN OIL WELL PUMPING UNIT

L. C. McClure, P.O. Box 505, Midland, Tex. 79701

Filed Jul. 1, 1976, Ser. No. 703,551
Int. Cl.[2] F16H *21/32*
U.S. Cl. 74—41 4 Claims



1. In combination with an oil well pumping unit comprising a walking beam oscillatable in a vertical plane about substantially a horizontal axis, a horsehead on one end of the beam and including a pair of side plates and an arcuate plate defining the face of the horsehead, a wire line assembly connected to the upper end of the arcuate face of the horsehead and connected to a polished rod at the lower end thereof, that improvement comprising an attachment for retaining the wire line assembly in overlying relation to the arcuate face to prevent bending of the polished rod during an upward movement of the horsehead in the event the polished rod does not move to its lowest position during a previous downward movement, said attachment comprising a pair of laterally spaced strap assemblies with each strap assembly including a pair of angularly disposed components connected together by a transverse spacing and pivoting assembly oriented in spaced, generally parallel relation to the arcuate face of the horsehead, means securing the free end portions of the components to the side plates of the horsehead to prevent the wire line assembly from falling off the edges of the arcuate face of the horsehead.

4,092,873

CONVERTING CONTINUOUS ROTARY MOTION

Saburo Murakami, Sakai, Japan, assignor to Wataru Shimokawa, Japan

Filed Nov. 25, 1975, Ser. No. 635,209
Claims priority, application Japan, Nov. 29, 1974, 49-136319; Oct. 21, 1975, 50-125843
Int. Cl.[2] F16H *27/04*
U.S. Cl. 74—82 10 Claims

1. Apparatus for converting a continuous rotary motion of a drive shaft into a rocking motion of a driven shaft, comprising:

(i) a drive shaft

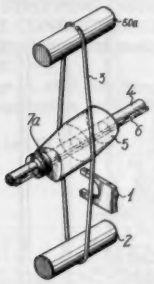
(ii) a profile cam member mounted on said drive shaft for rotation therewith, said cam member being axially slidable on said drive shaft, said cam member being circular at its axial center, said cam member having at each side of said axial center respective portions which have contours with a substantially triangular cross-section with rounded corners, each such portion of said cam member having opposed arcuate surfaces, the radius of one such opposed surface decreasing and the radius of the other of such opposed surfaces increasing considered in the direction

from said axial center towards the other end of each portion,

(iii) a driven shaft having its axis of rotation parallel to the axis of rotation of the drive shaft

(iv) a structural member mounted in fixed spaced relationship with respect to the axes of the drive shaft and driven shaft

(v) a cam follower comprising a pair of inextensible strands secured at a first end to said structural member and coupled at their second end to the driven shaft at a radial spacing from said driven shaft, said strands lying in a plane normal to the axis of the cam member, said strands being respectively in continuous abutment each with a diametrically opposed portion of the cam surface,



whereby as said cam member rotates and causes radial movements of said strands the driven shaft is caused to rock about its axis, the rocking motion being variable by axial shifting of the cam member to bring different contours of the cam member into abutment with the strands.

4,092,874

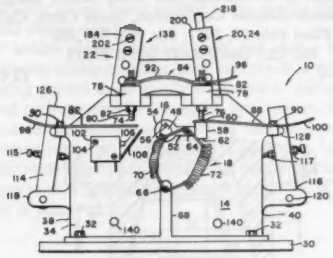
ACTUATOR MECHANISM

William C. Stange, Ellicott City, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 596,787, Jul. 17, 1975, Pat. No. 4,010,455. This application Dec. 6, 1976, Ser. No. 747,675

Int. Cl.² F16H *21/44*

U.S. Cl. 74—100 R **24 Claims**



1. An actuator mechanism comprising:

frame means;

shaft means rotatably supported in said frame means;

means for positioning said shaft means in at least two rotary positions;

at least one pair of plunger means coupled to said shaft means, each of said plunger means being responsive to a control signal for applying bidirectional rotation to said shaft means respectively; and

coupling means joined between said shaft means and each of said plunger means, said coupling means including;

sleeve means surrounding said shaft means and in sliding engagement therewith, said sleeve means having an elongated aperture extending therethrough for exposing said shaft means, and

pin means connected to said shaft means and radially extending through said aperture, said pin and shaft means being slidable within said aperture and sleeve means respectively for a determinable angle before said pin means contacts said sleeve means.

4,092,875

TUBE DRAWING METHOD AND APPARATUS

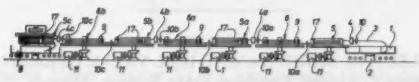
Otto Uhlmann, Burgdorf, and Norbert Stephan, Hanover, both of Germany, assignors to Marshall Richards Barcro Limited, Crook, England

Filed Feb. 11, 1977, Ser. No. 767,761

Claims priority, application Germany, Feb. 20, 1976, 2606809

Int. Cl.² B21C *1/10*

U.S. Cl. 72—275 **8 Claims**



1. A method of continuously drawing a succession of tube lengths having a plurality of successive drawing steps at a plurality of successive drawing stages respectively, each comprising a tube drawing die, a floating plug within the tube upstream of the die, and a downstream rotatable draw block operable for drawing the tube through the die, comprising the steps of selectively accumulating the tube between successive drawing stages while temporarily and separately discontinuing the drawing step at either stage and continuing the drawing step at the other stage; separately inserting each stage floating plug into the leading end of each oncoming tube length and then threading the leading end of the oncoming tube length through the die and if the oncoming tube length is a succeeding tube length, joining the leading end thereof to the trailing end of the preceding tube length, and operating the respective draw block for drawing the oncoming tube length through the die; and temporarily and separately discontinuing each drawing step and removing each end joint of successive tube lengths between stages, for the said inserting, threading and joining steps.

4,092,876

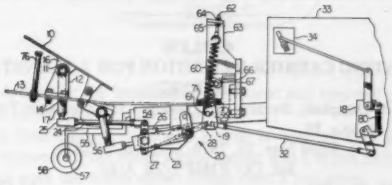
THROTTLE CONTROL SLIDER

James Harrie Povejsil, Willoughby, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Feb. 7, 1977, Ser. No. 766,101

Int. Cl.² G05G *9/00*; B60K *41/00*

U.S. Cl. 74—478 **8 Claims**



1. A linkage assembly comprising:

a frame member;

a pivot shaft mounted relative said frame;

an operator responsive pedal member mounted on said pivot shaft and rotatable thereabout in a pivoting motion from a neutral position in first and second directions;

first link means connected with said pedal for translating pivoted motion of said pedal to rotational motion;

a control rod reciprocally mounted relative said frame and movable in third and fourth directions;

bias means for biasing said control rod in said fourth direction;

second link means operably connecting said pedal member with said control rod for causing said control rod to move only in said third direction while said pedal member is rotated from its neutral position in said first and said second direction;

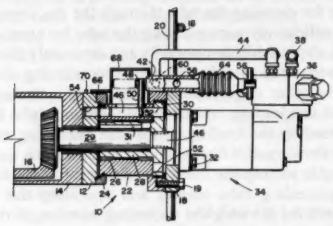
said second link means comprising a first arm affixed to and rotatable with said pivot shaft, a second arm coupled with said first arm and extending at generally right angles therefrom, an elongated lever mounted generally at its midpoint for rotation on said frame with said second arm coupled at one end of said lever, first and second lost motion links coupled with said lever each on opposite sides of the mounting thereof and extending outwardly in the same general direction; and, coupling means for associating said lost motion links with said control rod.

4,092,877

SELECTIVE MODE HANDWHEEL VALVE OPERATOR

Howard L. Ledeen, Pasadena; Franz Schmon, Granada Hills, and Willem E. Tupker, Sylmar, all of Calif., assignors to Ledeen Flow Control Systems Inc., Sun Valley, Calif.

Filed Mar. 14, 1977, Ser. No. 777,134
Int. Cl.[2] F16K *31/05*
U.S. Cl. 74—625 **14 Claims**



1. A selective mode valve operator comprising:

a stationary member adapted to be mounted on a valve body;

an output sleeve rotatable on said stationary member;

means on said output sleeve adapting it for rotary driving connection to a valve operating input shaft;

a handwheel coaxial with said output sleeve;

a hub extension on said handwheel;

a rotary motor drive having an output shaft adapted when activated for driving engagement with said output sleeve;

shift means for selectively locking said handwheel to one of said stationary member and said output sleeve; and

means preventing driving operation of said rotary motor when said handwheel is locked to said output sleeve.

4,092,878

FLOATING CARRIER RETENTION FOR A PLANETARY GEARSET

John J. Campbell, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1976, Ser. No. 743,384
Int. Cl.[2] F16H *1/28, 3/44*
U.S. Cl. 74—801 **12 Claims**

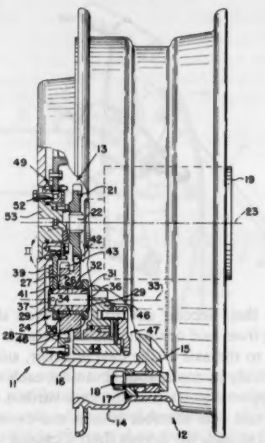
1. In a planetary gearing system, the combination comprising:

at least one sun gear defining a primary rotational axis,

at least one ring gear disposed in coaxial relationship with said sun gear and being of greater diameter than said sun gear,

at least one planet gear disposed between said sun gear and said ring gear and being engaged with each thereof, said planet gear having a secondary rotational axis which moves along an orbital path around said primary rotational axis upon differential rotation between said sun gear and said ring gear,

positioner means having an annular groove which is coaxial with said sun gear and said ring gear and of smaller diameter than said orbital path, said groove having axially spaced-apart wall surfaces, and



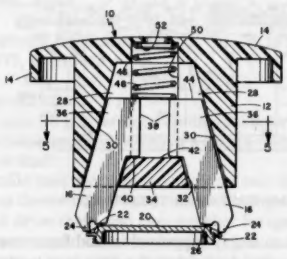
an annular planet gear carrier carrying said planet gear and being disposed for rotation about said primary axis as said planet gear orbits therearound, said planet gear carrier being of the floating form capable of limited nonrotational movements relative to said sun gear and ring gear, said planet gear carrier having an annular inner edge extending into said groove of said positioner means whereby axial movement of said carrier and said planet gear is restricted.

4,092,879

SCREW BACK REMOVAL TOOL

Gilbert Villanueva Hernandez, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 10, 1977, Ser. No. 767,300
Int. Cl.[2] G04D *3/00*; B25B *13/18*
U.S. Cl. 81—6 **12 Claims**



1. A self adjusting spanner wrench comprising:

a generally cylindrical body having a handle end and a gripper end,

a plurality of guide slots formed in said body and extending

axially and radially thereof, and including cam means defined by each of said slots,

a gripper member slideably mounted in each of said slots and including a gripper prong extending from the gripper end of said body, said gripper member disposed in engagement with said cam means, for radial movement in response to said cam means upon axial movement within said slot, and

biasing means within said body for biasing said gripper members to the outermost position in said guide slots.

4,092,880

APPARATUS FOR STRIPPING INSULATION FROM AN ELECTRICAL CONDUCTOR OR THE LIKE

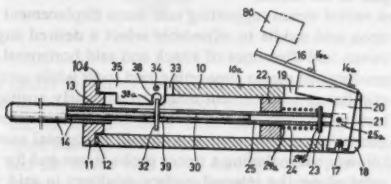
Kurt Kaufmann, Kloten, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,261

Claims priority, application Switzerland, Apr. 22, 1976, 5042/76

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 A **12 Claims**



1. An insulation stripping apparatus for partially removing an end section of insulation sheathing of an electrical conductor or the like, comprising:

a housing;

a thrust rod;

a restoring spring for exerting a restoring force upon said thrust rod;

means mounting said thrust rod to be axially displaceable in said housing against the restoring force of said restoring spring;

a holder clamp;

means for operatively connecting the holder clamp with said thrust rod;

a stripper clamp arranged in said holder clamp;

a traction rod arranged in said thrust rod;

means for operatively connecting said stripper clamp with said traction rod;

a sleeve member fixed to said housing;

said holder clamp together with said thrust rod and said stripper clamp being guided to be axially displaceable in said sleeve member;

said holder clamp together with said thrust rod and said stripper clamp together with said traction rod conjointly being guided to be axially displaceable during a holding- and cutting operation at which time the conductor is held and its insulation cut, whereas said stripper clamp together with said traction rod is guided to be axially displaceable relative to said holder clamp during a removal operation when the cut-through insulation of the conductor is removed.

4,092,881

APPARATUS FOR MAKING-UP AND BREAKING THREADED PIPE CONNECTIONS

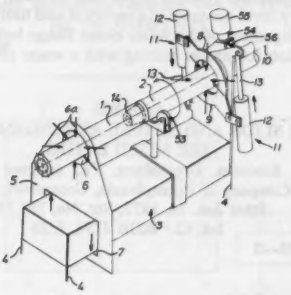
Rainer Jürgens, and Alfred Ostertag, both of Celle, Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Oct. 29, 1976, Ser. No. 736,728

Int. Cl.² B25B *13/50*

U.S. Cl. 81—57.34 **18 Claims**

1. Apparatus for the making-up and breaking of thread connections between tubular bodies and between drill strings and drilling tools for well bore drilling, comprising a supporting structure, a stationary bearing rack supported on said structure, a turnable fluid operated chuck seated on said bearing structure, a supporting rack mounted on said supporting structure for movement therealong towards and away from said bearing rack, a non-turnable fluid operated chuck mounted on said supporting rack in alignment with said turntable chuck to define a main axis therewith, said racks having coaxial openings through which the threaded tubular bodies can extend, a fluid operated torque producer for turning the



turnable chuck relative to the non-turnable chuck during clamping engagement between the chucks and threaded tubular bodies therein, said supporting structure being formed by an elongated distortion-free unitary support beam disposed parallel to said main axis and defining the path of movement of said supporting rack, said stationary bearing rack and supporting rack being mounted between the end portions of said support beam and on the exterior of said unitary support beam to be supported thereby.

4,092,882

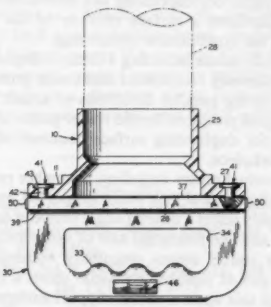
WATER CLOSET FLANGE WRENCH AND PULLER

Floyd Evans Whitmore, Ellington, Conn., assignor to Whitmore Tool & Die Co., Inc., Vernon, Conn.

Filed Jan. 16, 1976, Ser. No. 649,734

Int. Cl.² B25B *13/02*

U.S. Cl. 81—90 C **6 Claims**



1. A tool for the installation, alignment and removal of the water closet flange comprising:

a. a base element having a length at least as long as the diameter of the water closet flange, and a width sufficient to push the water closet flange onto a soil pipe;

b. a pair of line-up studs engagable with a respective pair of bolt head receiving slots in said water closet flange, said studs having a cylindrical body with a diameter of such size as to be accommodated in the bolt head receiving slot

and fixedly attached at a first end to a bottom surface of the base element;

c. a head element attached to a second end of the cylindrical body having a diameter larger than the cylindrical body and slidably and fixedly engagable in the bolt head receiving slot in the water closet flange, said cylindrical body having a length such that the head element when engaged in the water closet flange does not extend beyond the bottom surface of the water closet flange;

d. a handle attached to a top surface of the base element in a perpendicular relation to the base element; and

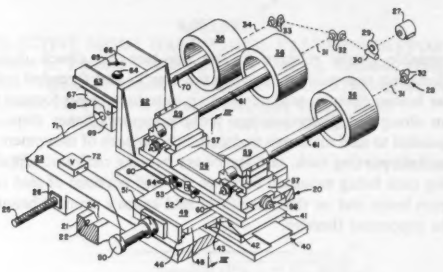
e. a spirit level mounted in a cavity in said tool for indicating the alignment of the water closet flange bolt head receiving slots for proper mating with a water closet.

4,092,883

LINEAR SLIDE AND SWIVEL ARRANGEMENT FOR A DIE MOLD LATHE

James J. Kindelan, Greensburg, Pa., assignor to Overmyer Mould Company of Pennsylvania, Greensburg, Pa.

Filed Jan. 14, 1977, Ser. No. 759,339
Int. Cl.[2] B23B *3/34, 3/28*
U.S. Cl. 82—3 **17 Claims**



1. In a machine tool having a saddle displaced by a driven feed member longitudinally along a bed for movement parallel to the rotational axis of chuck means adapted to support at least one workpiece at one end of the bed while the chuck is rotated by a drive in a predetermined relation to the rotation of a pattern at a laterally-displaced location where a tracer probe produces a signal corresponding to a desired movement of tool means to duplicate a surface contour of the pattern in the workpiece, the combination comprising:

a linear slide means including a linearly-displaced member to simultaneously reciprocate said tracer probe and said tool means along parallel directions of attack in response to said signal produced by the tracer probe to move the tool means for duplicating surface contours of the pattern in the workpiece,

a lower swivel means including a member rotatable about a generally vertical axis while supported by said saddle to adjustably select a desired angle between said directions of attack and the rotational axis of said chuck means,

an upper swivel means essentially consisting of a single upper swivel member rotatable about a single generally vertical axis upon a swivel support surface carried by the linearly-displaced member of said linear slide means, said single upper swivel member supporting and angularly positioning said tool means and said tracer probe means to always extend from the single upper swivel member in a generally parallel relation with the rotational axis of the chuck means,

tool holder means receiving said tool means for support by said single upper swivel member,

a carrier frame carrying said tracer probe for support by said single upper swivel member, and

fluid-actuator means coupled to said linear slide means to reciprocate said tracer probe and said tool means along said parallel directions of attack while the tracer probe and tool means extend from said single upper swivel member in the generally parallel relation with the rotational axis of the chuck means.

13. In a machine tool having drive spindles with chucks rotatable about parallel, horizontal axes while separately supporting a pair of die molds for machining by simultaneously movable tools carried by elongated bars that are controllably positioned in response to a tracer probe output signal corresponding to internal surface contours in a master mold while the mold is rotated about an axis parallel to said horizontal axes at a laterally-displaced location from said chucks, said machine tool including a saddle displaced by a driven feed member longitudinally of a bed along a course of travel toward and away from said chucks and generally parallel with said horizontal axes, the combination including:

linear displacement means carried by said saddle to simultaneously reciprocate said tools along parallel directions of attack to machine a design into the internal surfaces of said pair of die molds,

first swivel means supporting said linear displacement means upon said saddle to adjustably select a desired angle between said directions of attack and said horizontal axes,

second swivel means supporting said tools while carried by said linear displacement means to angularly position said bars while carrying said tools so that the bars extend in a generally-parallel relation with said horizontal axes,

a follower bar including a tracer probe at one end for movement along the internal surface contours in said master mold, and

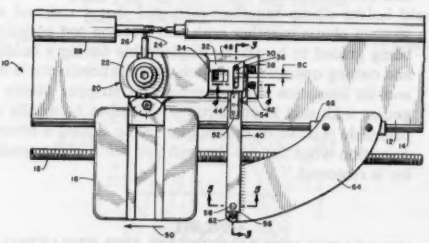
a swivel carrier frame supported by said second swivel means to angularly position said follower bar while carrying said tracer probe so that said follower bar extends in a generally-parallel relation with said horizontal axis while reciprocated by said linear displacement means.

4,092,884

LATHE ADAPTER FOR NON-STANDARD THREAD MACHINING

Ellwood J. King, 2750 Elmira St., Newbury Park, Calif. 91320

Filed May 19, 1977, Ser. No. 798,724
Int. Cl.[2] B23B *1/00*
U.S. Cl. 82—5 **25 Claims**



15. In a lathe having a carriage for driving a compound tool rest consisting of an upper block and a lower block, a lead screw for driving said carriage, and means for setting said lathe for cutting standard thread sizes, the improvement comprising:

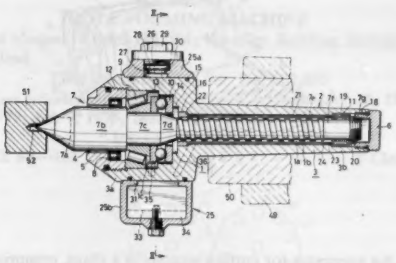
drive means for driving said upper block a predetermined incremental amount independent of and proportional to the movement of said carriage whereby said lathe may be set to cut threads any size between said standard settings.

4,092,885

CENTER FOR LATHES

Kiyotaka Kobori, 40-4 3-chome, Aoyamadai, Suita, Osaka, Japan

Filed Jun. 6, 1977, Ser. No. 803,857
Claims priority, application Japan, Jun. 9, 1976, 51-68115
Int. Cl.[2] B23B *23/04*
U.S. Cl. 82—33 R 11 Claims



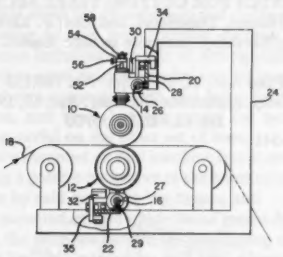
1. A center for lathes comprising a tubular casing with its interior serving as an oil chamber, a center rod fitting in the casing and having a conical front end projecting from the casing, front bearings and a rear bearing provided between the casing and the center rod, an oil feeding screw portion positioned between the front bearings and the rear bearing and formed on the center rod, and an oil reservior provided on the casing, forward and return oil channels extending between the oil reservoir and the oil chamber to permit the whole oil in the reservoir and the chamber to circulate within the center.

4,092,886

METHOD AND APPARATUS FOR SLITTING A CONTINUOUS WEB OF MATERIAL

Heinz K. Nowisch, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Jun. 13, 1977, Ser. No. 806,156
Int. Cl.[2] B26D *1/24*
U.S. Cl. 83—56 7 Claims



6. A method of lengthwise slitting a continuous web of material utilizing upper and lower disc-shaped web slitting members disposed on opposite sides of said web with their peripheral edge portions in engagement with one another where said web passes therebetween, said lower web slitting member being driven by a motor means having an armature mounted on a drive shaft also supporting said lower web slitting member, said method comprising the steps of:

activating said motor means for a sufficient time to bring said outer peripheral edge portion of said lower web slitting member up to substantially the same speed as movement of said web;

deactivating said motor means;

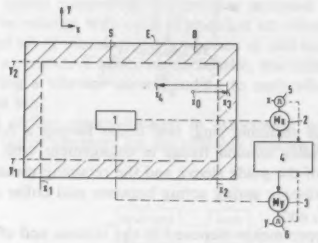
continuing to drive both said upper and lower web slitting members so as to slit said web by frictional engagement between said slitting members and said web.

4,092,887

METHOD FOR AUTOMATICALLY VARYING THE FEED RATE OF A WORKPIECE CARRIAGE IN A MACHINE TOOL

Günter Brömer, Spardorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 2, 1977, Ser. No. 802,968
Claims priority, application Germany, Jun. 28, 1976, 2628961
Int. Cl.[2] G05B *19/18*
U.S. Cl. 83—56 1 Claim



1. In a method for automatically varying the feed rate of a moving workpiece carriage in the proximity of permissible terminal positions for the carriage in a machine tool including a numerical control means for controlling the position of the workpiece carriage and means for determining the position of the workpiece carriage in the machine tool, the improvement comprising

storing signals corresponding to a plurality of safety positions of said workpiece carriage located within said terminal positions of said workpiece carriage in a memory device provided in said numerical control means, and

comparing said safety position signals with measured position signals generated by said workpiece carriage position determining means corresponding to the position of said workpiece carriage in said machine tool,

said feed rate of said workpiece carriage being automatically reduced by said numerical control means when said safety positions are passed by said workpiece carriage as said carriage moves in a direction towards said terminal positions, said feed rate reduction being cancelled by said numerical control means if a position signal is generated by said numerical control means for moving said workpiece carriage in a direction away from said terminal positions to a position within said safety positions in said machine tool.

4,092,888

SELF-STRIPPING PUNCH AND GUIDE ASSEMBLY

Kenneth J. Wilson, Roseville, Minn., assignor to Wilson Tool Company, St. Paul, Minn.

Filed Jul. 1, 1977, Ser. No. 812, 128
Int. Cl.[2] B26F *1/14*
U.S. Cl. 83—140 4 Claims

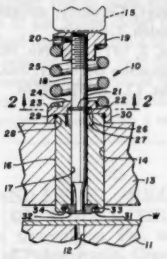
1. A punching device for use in a machine having a frame with a lower portion supporting a die and an upper portion having a vertical bore aligned therewith, said punching device comprising:

A. a guide sleeve adapted for slidable disposition in the bore in the upper portion of said machine frame, said sleeve having a circumferential groove adjacent its upper end, and a resilient retaining means in said groove,

B. a punch having a head and a body slidably disposed in said sleeve, said body having a circumferential groove spaced from the ends of the body,

C. a retaining ring disposed in said punch body groove, the outside diameter of said ring being substantially greater than the diameter of the punch body whereby the periphery of the ring projects beyond the periphery of the body,

D. a spring support collar slidably disposed on said punch body in normal engagement with the projecting periphery



of the retaining ring, said collar having a downwardly extending annular flange in engagement with the upper end of the guide sleeve and the retaining means therein,

E. a stripping spring acting between said collar and punch head, and

F. stripper means disposed in the bottom end of the guide sleeve.

4,092,889

SLOTTED WORKTABLE

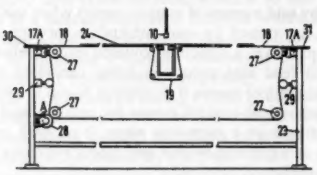
Martin John Fisher, Milton Keynes, England, assignor to The British Hydromechanics Research Association, Bedford, England

Division of Ser. No. 674,444, Apr. 7, 1976, Pat. No. 4,058,040. This application Aug. 22, 1977, Ser. No. 826,897

Claims priority, application United Kingdom, Apr. 9, 1975, 14619/75

Int. Cl.[2] B26F *3/00*

U.S. Cl. 83—177 **16 Claims**



1. A slotted worktable, comprising, a first frame having two oppositely-facing sides, securing means disposed in a horizontal plane and arranged on said oppositely-facing sides of the first frame, a single length of flexible support material extending between said securing means, the single length of flexible support material being in the form of an endless band, a second frame situated between said sides of the first frame and movable in a horizontal plane towards and away from said sides, a first pair of parallel rollers carried by the second frame and spaced apart in a horizontal plane substantially coplanar with said plane of the securing means, further roller means carried by the second frame and extending parallel to the first pair of rollers, below said plane of the first pair of rollers, the flexible support material being trained over the first pair of rollers and the further roller means so that said material passes over the first pair of rollers and below the further roller means to define a slot between the first pair of rollers.

4,092,890

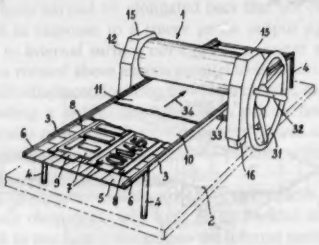
STENCIL-CUTTING MACHINE

Jacques Bousquet, Poncin, France, assignor to Etablissements Tiflex Société Anonyme, Poncin, France

Filed Mar. 29, 1977, Ser. No. 782,444

Int. Cl.[2] B26F *1/00*

U.S. Cl. 83—284 **7 Claims**



1. An apparatus for cutting stencils in a sheet, comprising a support, a press formed on said support and comprising a pair of superposed rollers separated by a gap, a plate, composed of ferromagnetic material slidably mounted on a support and shiftable between said rollers, alphanumeric - character cutting dies disposed on said plate and adapted to pierce said sheet upon said sheet being disposed on said dies, said dies lying on said plate and having upwardly turned cutting edges, means for rotatably displacing at least one of said rollers to advance said plate, said dies and said sheet between said rollers, whereby said rollers press said sheet against said dies, said support being provided with a pair of guide rails slidably receiving said plate and engaging opposite longitudinal edges thereof, said plate being provided with a pair of entrainment rails along its opposite longitudinal edges parallel to said guide rails and receivable between said support roller and said pressing roller for advancing said plate between said rollers; and at least one magnetic alignment rule overlying said plate and magnetically adherent thereto for lining up of said dies on said plate.

4,092,891

APPARATUS FOR CUTTING STEEL SECTIONS

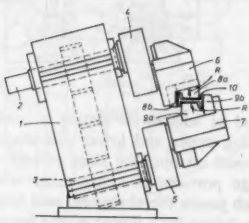
Manfred W. Hansen, Dusseldorf, and Emil F. Kersting, Ratingen, both of Germany, assignors to Sack GmbH, Dusseldorf, Germany

Filed Apr. 11, 1977, Ser. No. 786,133

Claims priority, application Germany, Apr. 15, 1976, 2616809

Int. Cl.[2] B23D *35/00*

U.S. Cl. 83—341 **6 Claims**



1. Apparatus for cutting rolled steel sections with a web and one or more flanges extending at an angle to the web, said apparatus comprising profiled cutters movable relative to each other on a common axis and kept parallel to each other at the time of the cut, the cutter edges for cutting the web of the section extending in an inclined manner at an acute angle (α)

with respect to a plane (N) at right-angles to said axis at the time of the cut, and extensions of the cutter edges following the shape of the flanges of the section at least as far as these extensions are located inside the projection of the section on said plane, such that the cutter edges associated with the flanges form an angle (β) with respect to said plane, whereby the flanges are cut over their full height from their outer surfaces.

4,092,892

HOLE FORMING MACHINE

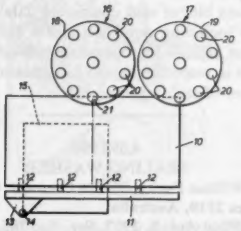
Ronald Moone, 11 Butts Hill Rd., Woodley, Reading, Berkshire, England

Filed Jun. 21, 1976, Ser. No. 698,295

Claims priority, application United Kingdom, Jun. 23, 1975, 26621/75; Jul. 9, 1975, 28939/75

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—413 **7 Claims**



1. A hole forming machine for producing a pattern of holes in a sheet of given material, comprising

(a) a machine frame,

(b) at least two spaced hole forming means connected with said frame, each of said hole forming means including

(1) a rotary turret;

(2) a plurality of punches mounted on said turret, said turret being rotatable to successively position said punches opposite a hole forming station on said machine frame; and

(3) means for operating that one of said punches which is positioned at said hole forming station at a given time;

(c) guide frame means connected with said frame for supporting said sheet for two-dimensional coplanar displacement relative to said hole forming stations, said guide frame means including two sets of orthogonally-arranged slidably connected pairs of parallel spaced bars, one set of said bars being connected with said frame for axial sliding movement, and sheet holding means for mounting the sheet of material on the other set of bars;

(d) a template mounted on said machine frame, said template containing a pattern indicative of the holes to be formed in said sheet by said hole forming means; and

(e) a stylus mounted on said guide frame means for cooperation with the template pattern for positioning said sheet at a desired location relative to said hole forming stations, whereby said hole forming means are operable to form on two separate areas of said sheet a two dimensional pattern of holes determined by the pattern on said template.

4,092,893

MULTIPLE SELECTIVE BELL CONSOLE AND INSTRUMENT

Ronald O. Beach, Doylestown, Pa., assignor to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Oct. 28, 1976, Ser. No. 736,405

Int. Cl.[2] G10H *3/00*; G10F *1/08*

U.S. Cl. 84—1.11 **14 Claims**

1. A carillon tone generator adapted for producing representations of a plurality of bell notes, comprising:

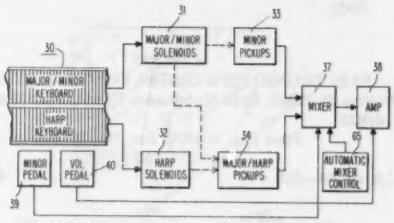
a. a first set of vibrators, each vibrator of said first set having a respective different characteristic;

b. first striker means positioned in operative relation to said first set of vibrators for controllably striking said first set vibrators to produce vibrations corresponding to respective tones, said first striker means comprising at least a first striker located in relation to each first set vibrator so as to cause said first set vibrator to produce a major tone when struck thereby and a second harp striker located at a respective different position relative to each of said first set vibrators so as to cause said first set vibrator to produce a harp tone when struck thereby;

c. first pickup means operatively associated with said first set of vibrators, for picking up a composite signal representative of the vibrations of said first set vibrators. said first pickup means comprising a transducer mounted in fixed operative relation with each of said first set vibrators;

d. a second set of vibrators, each vibrator of said second set having a respective minor characteristic, and said second set having a vibrator corresponding to each vibrator of said first set;

e. second striker means located in association with said second set of vibrators for controllably striking said second set vibrators, said second striker means comprising a striker positioned relative to each second set vibrator so as to cause said second set vibrator to produce a distinct minor tone when struck;



f. second pickup means operatively associated with said second set of vibrators for picking up a composite signal representative of the vibrations of said second set vibrators, said second pickup means comprising a transducer mounted in fixed operative relation with each of said second set vibrators;

g. means for selectively activating said first and second striker means, said activating means comprising control means for simultaneously activating corresponding strikers of said first and second sets;

h. mixer means connected to receive a major input from said first pickup means and a minor input from said second pickup means, for producing a mixed signal representative of a combination of said two inputs;

i. minor control means, in operative connection with said mixer means, for controlling the mixing operation of said mixer means; and

j. means for amplifying and transducing the output of said mixer means, thereby to provide a bell tone output.

4,092,894

MUSICAL SLIDE

Roy L. Clough, Jr., 1 N. Curtisville Rd., Concord, N.H. 03301

Filed Jul. 26, 1976, Ser. No. 708,718

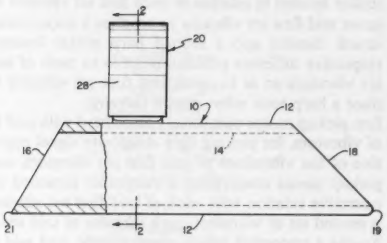
Int. Cl.[2] G10D *3/00*

U.S. Cl. 84—319 **11 Claims**

1. A device for use in varying the pitch of one or more strings of a stringed musical instrument, said device comprising an elongated body adapted to be hand held and being beveled at its opposite ends so as to provide front and back mutually converging end surfaces, the length of said body being such that when said body is held in a user's hand, one beveled end

may be engaged by the palm of that hand while simultaneously a finger of that hand may be engaged with the other beveled end; and

a loop member having one end fixedly secured to a side of said elongated body and its other end free and further



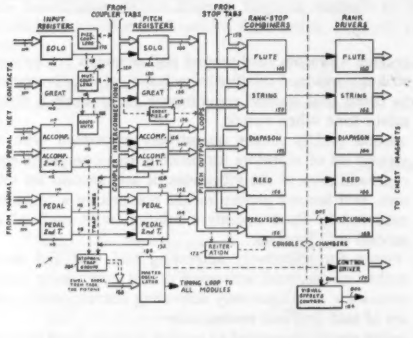
having a U-shaped portion spaced from said elongated body and formed to extend around the use's index finger so that the said index finger can be arched in order to exert, in a varied manner, pressure on the front end of said body.

4,092,895

ELECTRONIC PIPE ORGAN CONTROL SYSTEM

William P. Zabel, 8118 N. Sakaden Pkwy., Fort Wayne, Ind. 46825

Filed Dec. 6, 1976, Ser. No. 747,536
Int. Cl.[2] G10B *3/10*
U.S. Cl. 84—345 **40 Claims**



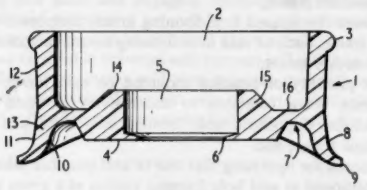
1. For use in a pipe organ which includes at least one manual having a plurality of manually operable keys disposed in chromatic spacial relationship, a plurality of stop tabs, and at least one rank of organ pipes individually operable by chest magnets, an electronic control system comprising: master oscillator means for generating a clock signal of predetermined frequency and control signals having predetermined time relationships to said clock signal; at least one input register means having control terminals connected to said master oscillator means to receive said clock and control signals therefrom, a plurality of input terminals connected to said manual, and an output terminal, for receiving note signals in parallel from said keys in response to operation thereof and repetitively generating a serial data signal at said output terminal, said serial data signal including a plurality of binary data bits, there being one said data bit for each key of said manual, said bits disposed in a chromatic sequential relationship corresponding to the spacial chromatic relationship of said keys; at least one pitch register means connected to said master oscillator means to receive said clock and control signals therefrom, and to said input register means to receive said serial data signal, said pitch register means including a plurality of pitch output terminals and pitch generating means for generating a plurality of pitch output signals in response to said serial data, clock, and control signals, each of said pitch output signals appearing at a particular pitch output terminal and including the binary data bits of said serial data signal inputted to said pitch register means, and transposed in time relationship, and thereby in representative chromatic musical relationship with respect to said binary data bits of said serial data signal; at least one combiner means connected to receive predetermined ones of said pitch output signals and to said stop tabs to receive stop tab signals and being responsive thereto to generate a composite data signal including selected combinations of said predetermined pitch output signals; at least one rank driver means connected to receive said composite data signal and said clock and control signals from said combiner means and said master oscillator means, respectively, for generating in response thereto a plurality of periodically updated parallel output signals corresponding in spacial chromatic relationship to individual ones of said binary data bits of said composite data signal, said rank driver means including amplifier means for amplifying said parallel output signals for operating individual ones of said chest magnets in response thereto for actuating corresponding individual ones of said organ pipes.

4,092,896

SEALING WASHER

David Peter William Puchy, 30 The Crescent, Cheltenham, New South Wales 2119, Australia

Filed Apr. 8, 1977, Ser. No. 785,815
Claims priority, application Australia, Apr. 30, 1976, PC5752
Int. Cl.[2] F16B *21/00*; A47G *3/00*
U.S. Cl. 85—50 R **7 Claims**



1. An annular washer to provide a seal between the upper surface of an object into which a fastening device, having a shank passing through said washer, is inserted; said annular washer having a substantially flat region on the underside of an annular boss surrounding the center aperture through said washer, and having a peripheral downwardly, outwardly extending resiliently deformable tapered annular skirt, said tapered skirt having its rim located below said flat region and being joined to the periphery of said boss by a deformable annular diaphram.

4,092,897

APPARATUS FOR WEAVING BRAIDED-WIRE SHEATHING INCLUDING MEANS FOR TWISTING BUNDLED STRANDS TO EQUALIZE TENSION

James M. Lalikos, Springfield, and Harold K. Waite, East Longmeadow, both of Mass., assignors to Titeflex, a division of Atlas Corporation, Springfield, Mass.

Filed Apr. 14, 1976, Ser. No. 676,940
Int. Cl.[2] D04C *3/12, 3/40*; F16L *11/02*
U.S. Cl. 87—29 **9 Claims**

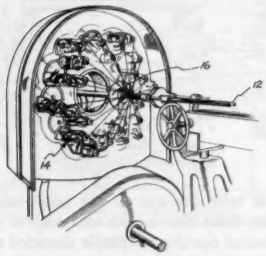
1. In apparatus for weaving a braided wire sheath around a tubular core which comprises, in combination, a plurality of bobbin-carriers each supplying a multi-strand bundle of wires, drive means for moving said carriers in opposing directions along sinuous paths as said tubular core is drawn longitudinally

whereby said bundles are interlaced in a woven pattern over the surface of said core;

the improvement comprising means for progressively twisting each of said multi-strand bundles in one direction about its length whereby strands under less tension tend to be wound helically about the strands under greater tension.

4. Apparatus for fabricating high-pressure hose composed of an inner tube reinforced by an outer braided sheath woven from high tensile-strength wire which comprises, in combination:

first and second sets of bobbin-carriers, each of said bobbin-carriers paying out a multi-strand bundle of wires under tension;



drive means for moving said first set of bobbin-carriers in a first direction along a sinuous track around said inner tube and for moving said second set of bobbin-carriers in the opposing direction along a different sinuous track around said tube whereby said bundles pass alternately over and under one another to form a predetermined woven pattern over the surface of said tube;

a feeding member mounted for rotary movement on each of said bobbin-carriers, said feeding member having an elongated slot therein forming a passageway for one of said bundles; and

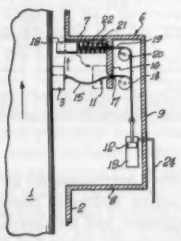
drive means for rotating said feeding member to twist said bundle and it is fed to the surface of said inner tube.

4,092,898

SHOCK-EXCURSION APPARATUS FOR RETRACTING THE UMBILICAL PLUG OF A MISSILE

John F. Witherspoon, Mountain View, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,511
Int. Cl.[2] F41F 3/04
U.S. Cl. 89—1.811 6 Claims



1. For use with a launch-gas powered missile having an umbilical plug separably coupled into its side wall and electrical power conduit coupled to the plug; apparatus for physically disengaging and retracting said plug during the initial launching movement of the missile from its launching tube comprising:

a plug-disengaging stop member carried by said launching tube in the path of travel of the plug for forcefully disengaging the plug during missile lift-off,

a flexible line secured at one end to said plug,

a launch-gas driven retract means having a driven member secured to the other end of the line, and

conduit means for applying said launch-gas pressure to said driven member for moving it in a line-pulling direction whereby said disengaged plug is retracted,

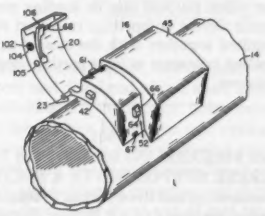
said flexible line being provided with a catenary for accomodating shock excursions of said launching tube relative to said missile and for assuring plug disengagement prior to said retraction.

4,092,899

REAR GATE PEEP SIGHT DEVICE

Jeffrey A. Lienau, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1977, Ser. No. 784,105
Int. Cl.[2] F41F 3/04
U.S. Cl. 89—1.816 6 Claims



1. A rear gate peep sight device comprising a launcher; a front sight mounted adjacent one end of said launcher; a firing mechanism mounted on said launcher, said firing mechanism including a safety and a firing button for firing a rocket; and a cover mounted on said firing mechanism and inclosing said safety and said firing button when in a closed position, said cover being movable to an open position, said cover having a rear peep sight built therein and alignable with said front sight mounted on said launcher for aligning said launcher with a target.

4,092,900

WEAPON SYSTEM EQUIPPED WITH RELOADING CONTAINER

Conrad Hottinger; Bruno Ruppen, both of Zurich, and Kurt Schaffner, Worblaufen, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Mar. 17, 1977, Ser. No. 778,681
Claims priority, application Switzerland, Mar. 30, 1976, 3948/76
Int. Cl.[2] F41F 9/06
U.S. Cl. 89—33 B 5 Claims

1. A weapon system comprising:

a gun mount;

an automatic gun arranged at said gun mount;

an ammunition container provided for said automatic gun;

means for supporting said automatic gun together with said ammunition container to be pivotable about an elevation alignment axis;

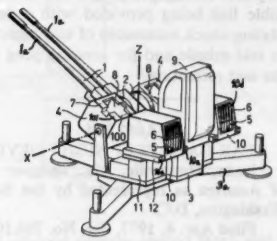
a reloading container for cartridges, said reloading container having an outlet opening and being arranged at said gun mount;

a conveyor device provided for the reloading container for forwardly displacing sets of cartridges located in the reloading container to said outlet opening, from which

location the cartridges can be filled into the ammunition container;

said ammunition container having an inlet opening for receiving the cartridges from the reloading container;

said supporting means mounting said ammunition container to be pivotable into a cartridge loading position;



means for displaceably mounting the reloading container at the gun mount in order to bring the outlet opening thereof into alignment with the inlet opening of the ammunition container when pivoted into its loading position; and

said conveyor device comprising transport elements which can be shifted together with the sets of cartridges out of the reloading container at least partially into the ammunition container.

4,092,901

DEVICE FOR FIREARM INTENDED FOR TANK WHICH HAS A BARREL SUPPORTED IN A RECOIL JACKET

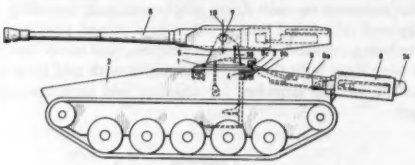
Lars G. T. Gustavsson, and Sven-Håkan Svensson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Sep. 10, 1976, Ser. No. 722,185

Claims priority, application Sweden, Sep. 12, 1975, 7510205

Int. Cl.[2] F41F *9/04*

U.S. Cl. 89—46 **10 Claims**



1. A protective device for a firearm of the type having a barrel supported in a recoil jacket and located in a tank provided with loading members for the firearm intended to convey rounds to the firearm from a magazine separate from the firearm via the under side of the recoil jacket, characterized in that the recoil jacket in connection with said under side has an opening and covers which can be opened and closed, with at least one first cover supported in the recoil jacket and at least one second cover supported in the breech ring of the barrel; and in that the first and second covers are located at different levels so that at the recoiling of the firearm in the recoil jacket they will slide one over the other.

4,092,902

LATHE ATTACHMENT FOR GENERATING SPHERICAL SURFACES

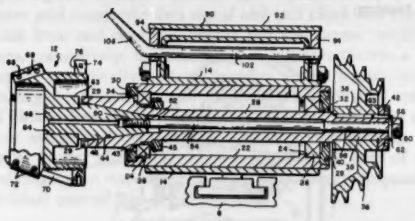
Joseph W. Serafin, 222 Flat Hills Rd., Amherst, Mass. 01002

Filed Feb. 28, 1977, Ser. No. 772,544

Int. Cl.[2] B23B *3/22*; B23C *3/04*

U.S. Cl. 90—11 D **5 Claims**

1. An attachment for a lathe comprising a cutting head, a motor and mounting structure therefor, said mounting structure comprising a base plate for attachment to the cross slide of a lathe, a housing comprising an elongate, substantially cylindrical clamp, a shelf for mounting the motor, a bearing sleeve clamped in the housing, said bearing sleeve having at its opposite ends bearings, a drive sleeve rotatably mounted in said bearings with its ends extending from the ends of the housing, an internally conical opening in one of the projecting ends of the drive sleeve, an internally cylindrical opening in the other projecting end of the drive sleeve, said cutting head being of circular right section containing at one end peripherally spaced holes, the axes of which converge toward said one end of the head, cutters fixed in the holes and a conical neck at the other



end concentric with the axis of the head, said head being mounted to the drive sleeve with said conical neck engaged within said conical opening, a spindle threaded at its opposite ends mounted in the drive sleeve with one of its threaded ends threaded into the conical neck and its other end extending through said cylindrical opening, a nut threaded onto said other threaded end of the spindle against the end of the drive sleeve, clamping the conical neck within the conical opening for rotation of the head with the drive sleeve, a pulley fixed to the drive sleeve, a motor bolted to the shelf and means drivably connecting the motor to the pulley.

4,092,903

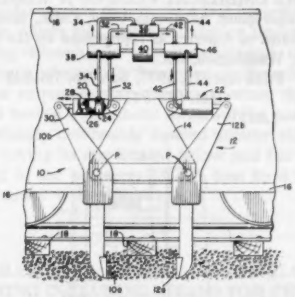
VIBRATORY DRIVE MECHANISM

Franz Ailmer, Sophia, N.C., assignor to Graystone Corporation, Monroeville, Pa.

Filed Nov. 17, 1975, Ser. No. 632,710

Int. Cl.[2] F15B *21/02*

U.S. Cl. 91—36 **13 Claims**



1. A vibratory drive mechanism for an oscillating tool, comprising: a single-acting hydraulic piston assembly having a ported pressure chamber and a reciprocating output member adapted to be operatively connected to vibrate the tool, a rotary distributing valve, fluid supply, and separate return line means connecting said piston pressure chamber via said rotary valve to a source of pressurized hydraulic fluid, said rotary valve including a ported cylindrical shell member having a first pair of openings connected with said supply line means and a second pair of openings connected with said return line means and axially displaced from said first pair of openings, a

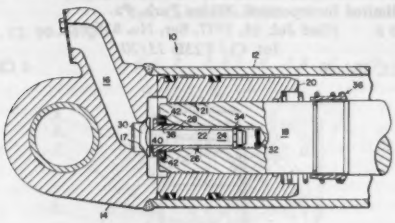
ported cylindrical spool member coaxially received in said shell for continuous sealing rotation therein having first and second axially displaced throughports positioned for alternate registration, respectively, with said first and second pairs of shell member openings, and drive means for imparting continuous rotation to said spool member in said shell member.

4,092,904

MEANS FOR RETAINING A PISTON ON A PISTON ROD

Larry Donald Schreiber, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 17, 1976, Ser. No. 724,396
Int. Cl.² F15B *15/22*; F16J *1/00*
U.S. Cl. 91—395 **1 Claim**



1. In a hydraulic actuator including a cylinder having a capped end and a piston and rod having respective threaded end portions with the piston being threaded on the rod and received in the cylinder, a fluid passage located in the capped end and including an inner end defining an axially centered valve seat, a blind bore extending into the piston rod from an extreme end of the latter in axial alignment with the valve seat, a valve element reciprocably received in the blind bore, and a spring biasing the valve element toward engagement with the valve seat, an improved means for preventing the piston from accidentally rotating relative to the piston rod, comprising: a diametrically extending recess located in the extreme end of the rod; said piston having an extreme end provided with a diametrically extending recess disposed in radial alignment with the recess in the rod; a locking member being received on the valve element and in the respective recesses of the rod and piston; and a guide member for the valve element having the latter reciprocably received therein and being threaded into said blind bore; and said guide member including a flange located adjacent to the locking member for retaining the latter in the respective recesses of the rod and piston.

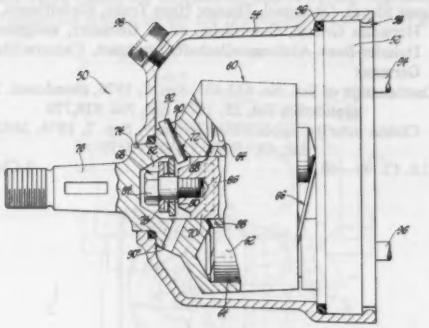
4,092,905

AXIAL PISTON PUMP

Robert A. R. Wood, West Vancouver, Canada, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Feb. 17, 1976, Ser. No. 658,168
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **12 Claims**

1. An axial piston pump assembly comprising; housing means including first and second interconnected housing portions, a cylinder barrel rotatably supported in said housing means, said cylinder barrel including a drive shaft extending therefrom and through and exteriorly of said second housing portion, a plurality of pistons reciprocatively supported in a plurality of piston cavities in said cylinder barrel for reciprocating movement parallel to an axis of rotation, cam means disposed between said pistons and said first housing portion for reacting with said pistons for causing said reciprocating movement thereof upon rotation of said cylinder barrel, shaft means extending from said first housing portion and into said cylinder barrel to a distal end for rotatably supporting said cylinder barrel, said cylinder barrel including fluid ports extending between each of said piston cavities and said shaft means, said shaft means including valving passages for successively communicating with said fluid ports during rotation of said cylinder barrel for directing fluid to and from said piston cavities, connecting means interconnecting said cylinder barrel and said distal end of said shaft means for transferring reaction forces resulting from said reciprocating movement of said pistons by said cam means through said shaft means to said first housing portion while freely allowing rotation of said cylinder barrel on said shaft means, said shaft means extending into said cylinder barrel to a distal end thereof, said cylinder barrel defining a cavity adjacent said distal end of said shaft means, said cylinder barrel including a plurality of holes extending therethrough from the exterior thereof to said cavity therein, said connecting means including a thrust bearing supported at said distal end of said shaft means and a plurality of pins secured in at least some of said holes and engaging said thrust bearing on the side thereof facing said distal end of said shaft means.

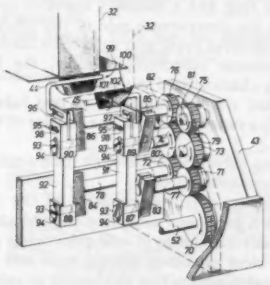


4,092,906

CARTON FLAP FOLDING MECHANISM

Hans Rolf Ingemar Linnér, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Mar. 15, 1977, Ser. No. 777,721
Claims priority, application Sweden, Nov. 12, 1976, 7612634
Int. Cl.² B31B *1/52*
U.S. Cl. 93—49 R **7 Claims**



1. A carton flap folding mechanism for use in a packaging machine in which a series of folding boxes having at least one open end, and at least one pair of sidewall flaps oppositely positioned at said open end of the folding box is folded inwards over the open end, said folding mechanism comprising:

a pair of folding pin members each adapted to be movable against a respective sidewall flap of adjacent boxes in the series of folding boxes, the path of movement of each of said pin members being a segment of a substantially circular path of travel, the center of said circular path of travel being between the plane of said open end and the opposite

end of the folding box, and wherein during a first phase of movement said folding pin members fold said respective flaps inwards over the open ends of respective folding boxes positioned adjacent each other; and

means for moving said folding pin members.

4,092,907

OUTLET NOZZLE FOR HEATING AND VENTING SYSTEMS OF AUTOMOBILES

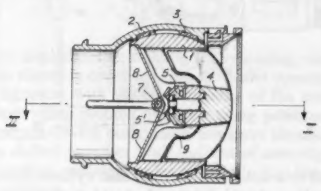
Ernst Meyer, Oberursel, Taunus; Hans Trube, Sindelfingen, and Hermann Grimm, Ostelsheim, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Unterturkheim, Germany

Continuation of Ser. No. 611,431, Sep. 8, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,770

Claims priority, application Germany, Sep. 7, 1974, 2442946

Int. Cl.[2] F24F *13/06, 13/10*

U.S. Cl. 98—40 A **9 Claims**



1. An adjustable air outlet nozzle especially suited for heating and venting or air-conditioning systems of automotive vehicles and comprising: a generally tubular stationary connector housing attachable to the end of an air duct, the housing having an enlarged central length portion defining a lodgement with an inner guide surface of hollow-spherical contour; a spherical ring whose outer surface is shaped after a bilaterally truncated sphere and which is supported in a universally pivotable manner inside said connector housing lodgement; a double-wing butterfly valve arranged inside the spherical ring on the upstream side thereof, the valve having two wing flaps arranged on a common pivot shaft which extends transversely across the inner diameter of the ring, the two wing flaps carrying bevel gear segments cooperating with a common drive bevel gear arranged in the center axis of the nozzle and journalled for rotation inside a transverse supporting member of the spherical ring; and a manually operable control member arranged on the downstream side of the spherical ring and attached to the drive bevel gear so as to be carried by the ring and its transverse supporting member, the improvements therein being characterized in that:

the spherical ring is constituted of two halves which are joined in a radial plane near the equator of their spherical shape;

the two ring halves define between them a radially inwardly facing positioning groove;

the transverse supporting member of the spherical ring includes a peripheral mounting ring which is receivable and axially clampable in said positioning groove, and a narrow stem extending radially from side to side of the peripheral mounting ring and having an enlarged hub-like central portion with an axial bore inside which the drive bevel gear and the attached control member are journalled;

the control member has the shape of a cross handle defined by two perpendicularly crossed radial arms extending across the inner width of the spherical ring, said arms being shaped so as to serve as air flow guides, with an axial width several times greater than the circumferential width, the arms having on their upstream side an outline which generally matches the outline of the supporting member stem; and

the drive configuration between the control member and the butterfly valve, via said bevel gear drive, is such that the wing flaps of the valve, in their fully open position, are substantially aligned with a central axial plane through the valve pivot shaft and one radial arm of the control member is likewise aligned with said plane, while the stem of the supporting member is similarly axially aligned with one radial arm of the control member, whereby the valve and its pivot shaft define axially aligned air guide surfaces on the upstream side of the nozzle, while the supporting member stem and the radial arm of the control member define similarly aligned air guide surfaces on the downstream side of the nozzle.

4,092,908

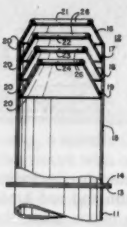
FLUIDIC SEAL

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Jul. 15, 1977, Ser. No. 815,992

Int. Cl.[2] F23D *13/20*

U.S. Cl. 98—60 **6 Claims**



1. A vent stack for waste gas comprising, in said stack,

a fluidic diode permitting flow for discharge of combustible waste gas and obstructing return flow in the stack,

said fluidic diode comprising at least one axially aligned frustoconical baffle with a central opening, and means for inhibiting static electricity generation at said diode comprising a ring in surrounding relationship to a baffle central opening having a smooth surface curved in the direction of discharge gas flow.

4,092,909

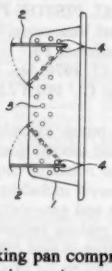
PERFORATED SELF-DRAINING MEATLOAF BAKING PAN

John M. Phillips, 2389A Carlton Pl., Costa Mesa, Calif. 92627

Filed Jul. 12, 1976, Ser. No. 704,734

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—444 **4 Claims**



1. A self-draining baking pan comprising:

a receptacle for receiving an item to be baked, said receptacle including a bottom wall and a peripheral wall, said peripheral wall being joined to the bottom wall and projecting outwardly therefrom;

at least one leg stand;

means for attaching said leg stand to said peripheral wall for pivotal movement, said leg stand being pivotable to an extended position in which it can engage a supporting

surface to support said bottom wall above the supporting surface and in spaced relationship to the supporting surface;

means for releasably retaining the leg stand in the extended position; and

drain hole means in said bottom wall and in said peripheral wall whereby fat and juices from the item being baked can drain from said receptacle through said drain hole means.

4,092,910

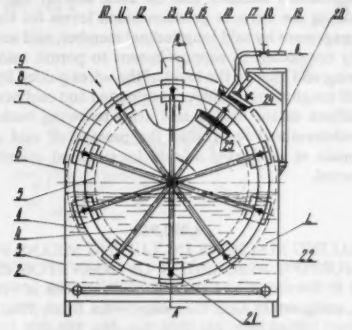
MACHINE FOR VACUUM PEELING FRUITS AND VEGETABLES

Lyubomir Nikolov Genchev; Iliya Chudomirov Kafedjiev, and Kostadin Spirov Klyamov, all of Plovdiv, Bulgaria, assignors to DSO "Bulgarplod", Sofia, Bulgaria

Filed Nov. 28, 1975, Ser. No. 636,073

Int. Cl.[2] A23N *7/01*

U.S. Cl. 99—472 **4 Claims**



1. In an apparatus for vacuum-peeling fruits and vegetables, a tank adapted to contain treating liquid, means associated with the tank for heating such liquid, a rotor mounted within the tank for rotation in a vertical plane about a horizontal axis, a plurality of buckets individually carried at circumferentially spaced portions of the rotor for receiving fruits and vegetables to be treated, means for rotating the rotor to advance the buckets through the treating liquid in succession, a vacuum-applying station cooperable with the successive buckets after they emerge from the treating liquid, a delivery chute for charging fruits and vegetables into the buckets, and a removal chute for discharging fruits and vegetables after they have been treated to vacuum in the vacuum-applying station, the improvement wherein the buckets have open radially inner and outer surfaces; in which the vacuum-applying station is disposed in the tank in the path of rotation of the successive buckets; and in which the vacuum-applying station comprises, in combination, a pair of radially opposed bucket seals individually engageable with the radially inner and outer surfaces of the bucket, means to sealingly engage said bucket seals with said inner and outer surfaces including means supporting a first one of the bucket seals for radial movement toward and away from one of the inner and outer surfaces of the bucket, and vacuum chamber means coupled to the movably supported first one of the bucket seals.

4,092,911

BLANCHING APPARATUS

Richard J. Goodale, P.O. Box 268, Watsonville, Calif. 95076

Filed Jan. 21, 1977, Ser. No. 761,977

Int. Cl.[2] A23C *3/02, 9/02, 13/04*

U.S. Cl. 99—483 **8 Claims**

1. Apparatus for blanching products such as vegetables by exposing the vegetables to steam from a steam source, said apparatus comprising in combination:

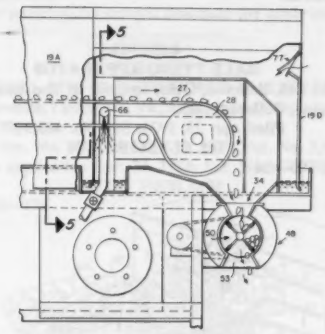
a container forming a blanching chamber;

a conveyor system for transporting vegetables from one end of said chamber to the other, said conveyor system comprising a conveyor belt fixed between two spaced drive rollers positioned at opposite ends of the chamber;

first valve means for introducing vegetable into one end of the chamber for deposit onto the receiving end of said conveyor belt;

second valve means for receiving vegetables from the conveyor belt at the other end of said chamber and for transporting said vegetables from said chamber;

said valve means for introducing and receiving vegetables including sealing means for preventing the escape of gas



from said chamber and allowing a buildup of pressure within the chamber;

a steam conducting manifold connecting with the steam source for the transport of steam to spaced points along said conveyor carrying the vegetables for exposing the vegetables to steam during their travel through the chamber; and

pressure relief means for permitting air to enter the chamber with the occurrence of a below atmospheric pressure condition within the chamber caused by the sudden condensing of steam therein while preventing the passage of air from the chamber.

4,092,912

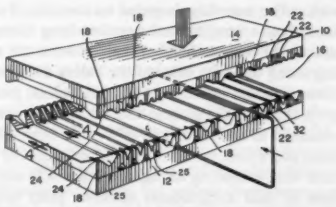
PRESS PLATEN WEDGES

Emil Simich, Chicago, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Jun. 11, 1976, Ser. No. 695,065

Int. Cl.[2] B65B *13/02*

U.S. Cl. 100—3 **4 Claims**



4. A method of producing high density bales of a material comprising:

compressing the material to be baled between a pair of press platens defining a compression chamber therebetween, each of said platens having a plurality of contoured platen wedges mounted thereon in aligned relationship, with each of said contoured platen wedges further having two spaced corner end means at each end thereof extending into the compression chamber which provide bale tie

accommodating channels between adjacently mounted platen wedges to thereby provide a reduced girth on the bale where said corner end means on said wedges engage the corners of the bale,

inserting tie means into the bale tie accommodating channels to encircle the compressed bale of material having a reduced girth where said corner end means on said wedges engage the corners of the bale,

securing said tie means to said compressed bale of material, and

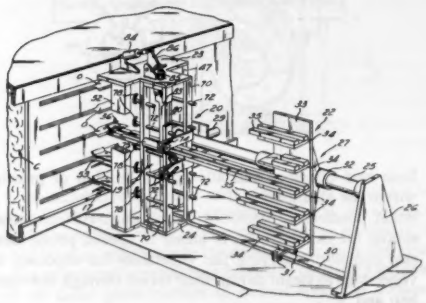
releasing the press platens to provide a high density bale of material.

4,092,913

BALE TYING APPARATUS

Frank C. Tea, Bellevue, Ohio, assignor to The American Baler Company, Bellevue, Ohio

Filed Apr. 23, 1974, Ser. No. 463,319
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—24 **10 Claims**



1. Bale tying apparatus for use with a baler, said baler including a baling chamber having sides, a feed hopper having an opening into said chamber for delivering to said chamber material to be baled, a baling head having open sided slots in its face and reciprocable within said chamber and past said feed hopper opening to a forward position of extension, and means to reciprocate said head, said tying apparatus comprising

wire dispensing means on opposite sides of said baler,

wire guide means on opposite sides of said baler for guiding wires dispensed from said dispensing means and extending through said chamber on the forward side of the feed hopper opening and along each side of said chamber and a bale formed therein,

a wire puller assembly mounted on one side of said chamber, including a longitudinal member long enough to reach across the baling chamber and between the wires extending along opposite sides of the baling chamber, means for extending and retracting said longitudinal member along a path through the slots in the baling head and across said chamber to and from said other side from and to said one side, and a nose on said longitudinal member for engaging said wire extending along said other side whereby retraction of said longitudinal member pulls wire from said dispensing means on said other side across said chamber and positions a length of wire drawn from said other side closely adjacent a corresponding length of wire on said one side, said nose on the front end of said longitudinal member having a downturned forward end extending lower than the level of the wires and a rear end standing higher than the level of the wires so that upon extension of said longitudinal member said downturned forward end of said nose lifts said wires and said longitudinal member passes under them without engagement, and upon retraction said rear end of said nose is engaged by said wires as encountered and pulled in the direction of retraction by said longitudinal member,

a pair of rotatable twister means spaced apart and supported for rotation on said one side of said chamber and on opposite sides of said path of extension and retraction of said longitudinal member each for engagement of each with said wires at a point spaced from the other along said adjacent lengths thereof, means to rotate said twister means whereby said wires are twisted together for a distance from the point of engagement of each of said twister means,

cutter means mounted on said one side of said chamber along said path of extension and retraction and between said spaced twister means for cutting both said wires in said adjacent lengths thereof and between the spaced points of engagement of said twister means,

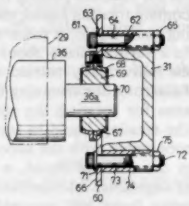
said wire guide means comprising guide arms positioned on each side of the path of extension and retraction of said longitudinal member and on each side of the baler for holding the wires at predetermined levels for the desired engagement by said longitudinal member, said arms pivotally connected to support means to permit said arms to swing and change the level of the wires guided by them as said longitudinal member is extended and said nose passes, resilient means urging said arms to swing back to their predetermined level after the passage of said nose and remain at said level as said longitudinal member is retracted.

4,092,914

BALING MACHINE INCLUDING MEANS FOR ADJUSTING ALIGNMENT OF CONVEYOR BELTS

Donald E. Burrough, and Dean E. Seefeld, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Nov. 26, 1976, Ser. No. 745,219
Int. Cl.[2] B30B *5/06*
U.S. Cl. 100—88 **3 Claims**



1. A crop handling machine for forming cylindrical bales and comprising:

a mobile frame including a pair of transversely spaced apart vertical support structures;

a plurality of transversely spaced apart conveyor belts between said support structures and forming at least a portion of an upper belt flight of a bale forming chamber;

means for supporting said conveyor belt including a plurality of horizontal spaced apart parallel rollers, each of said rollers being supported between said vertical support structures and being rotatable about an axis, said conveyor belts contacting each of said rollers and defining an angle of wrap around each of said rollers;

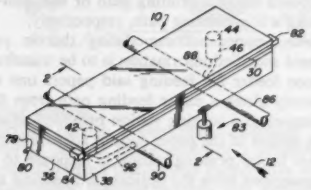
means for controlling the transverse position of said conveyor belts on said rollers including means for supporting at least one of the ends of said rollers on said upper belt flight for movement in an arcuate path generally perpendicular to the axis of said one of said rollers and perpendicular to a plane bisecting the angle of wrap defined by the conveyor belts contacting said one of said rollers, said means for supporting at least one of said ends of one of said rollers including skewing means having a spherical bearing whereby relative skewing of the roller during the arcuate movement of one of the ends of one of said rollers

imparts a force on the belts in the direction of the longitudinal axis of one of said roller, wherein said means for supporting at least one of said ends includes a bracket having means for rotatably supporting said one of said ends and means for supporting said bracket for pivotable movement about a pivot axis, said pivot axis and the axis of said one of said rollers being spaced apart and defining a plane generally bisecting the angle of wrap defined by the conveyor belts contacting said one of said rollers.

4,092,915
OIL HEATED DOUBLE FACER PLATEN

Thomas R. Keeny, Lindenwold, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 614,050, Sep. 17, 1975, Pat. No. 4,023,481. This application Feb. 10, 1977, Ser. No. 767,610
Int. Cl.² B30B *15/34*
U.S. Cl. 100—93 P **11 Claims**

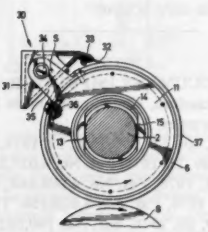


1. A platen for heating a web of corrugated board in a double facer and adapted for receiving a heated liquid transfer medium comprising a main plate having a planar outer surface for contact with the web, a second plate below said main plate, a peripheral spacer between said plates to define a shallow chamber for the heated medium, said chamber having an inlet and an outlet, beam means connected to said plate for stiffening said plates, means associated with said beam means for modulating the temperature of said beam means to compensate for a deflection in said main plate caused by a temperature difference between said main plate and said second plate.

4,092,916
CONTROLLED-DEFLECTION ROLL

Christoph Link, and Wolf-Gunter Stotz, both of Ravensburg, Germany, assignors to Escher Wyss Limited, Zürich, Switzerland

Filed Aug. 19, 1977, Ser. No. 826,159
Claims priority, application Switzerland, Sep. 22, 1976, 11989/76
Int. Cl.² B30B *3/04*
U.S. Cl. 100—174 **5 Claims**

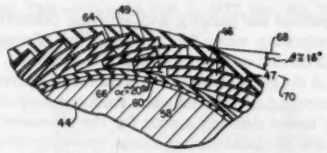


1. A controlled-deflection roll comprising:
a stationary roll support;
a substantially tubular roll shell having an outer surface;
means mounting said tubular roll shell to be rotatable about said stationary roll support;
at least one bearing element by means of which the tubular roll shell bears on the roll support;
said roll shell having opposed ends;
said mounting means including guide members rotatably mounted in the roll shell and guided upon the roll support in the direction of the pressing or disengaging movement of the roll shell;
a scraper device having a scraper blade provided for the controlled-deflection roll;
said scraper blade, during operation of the controlled-deflection roll, being in contact with the outer surface of said roll shell; and
means for securing the scraper device to the guide members.

4,092,917
NIP ROLL FOR TREATING WEB MATERIALS

Ernest J. Groome, Covington, Va., assignor to Clupak, Inc., New York, N.Y.

Division of Ser. No. 582,105, May 30, 1975, Pat. No. 3,995,354. This application Apr. 14, 1976, Ser. No. 676,804
Int. Cl.² B30B *3/04*
U.S. Cl. 100—176 **1 Claim**



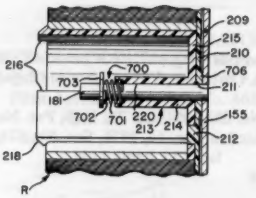
1. An apparatus for compacting web materials and the like which comprises:
a. a frame;
b. a substantially rigid roll member rotatably mounted on said frame;
c. a nip roll nipped in engaged rotational rotation with said substantially rigid roll having:
1. an inner substantially cylindrical member constructed of a substantially rigid material;
2. a cover member of a generally incompressible substantially resilient material positioned about said inner member and secured to the outer surface portions thereof; and
3. reinforcing members positioned within said cover member and forming a part thereof and having a tensile modulus of elasticity greater than the modulus of the generally incompressible resilient material, each of said reinforcing members being sloped at a generally acute angle with respect to an associated outer surface portion of the inner member, the direction of slope being such that rotating at least one of said rolls in a direction such that the reinforcing members approach the generally rigid roll in an orientation generally similar to the plane of a web material passing therebetween and the reinforcing members resist substantial displacement of the generally incompressible material, in a direction toward the entrance to the nip, but permit displacement of the generally imcompressible material toward the exit side of the nip such that upon leaving the nip zone the displaced incompressible material recoils opposite to the direction of movement of the web and the speed thereof is less than the speed of the material entering the nip thereby providing compacting forces substantially within the plane of the web material;
d. means to apply adjustably variable forces between said rolls for varying the nip between said nip roll and said substantially rigid roll; and
e. means for drivingly rotating at least one of the covered roll and generally rigid mating roll.

4,092,918

LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 476,744, Jun. 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, Jul. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Mar. 17, 1976, Ser. No. 667,761
Int. Cl.[2] B41F *1/08*
U.S. Cl. 101—288 22 Claims



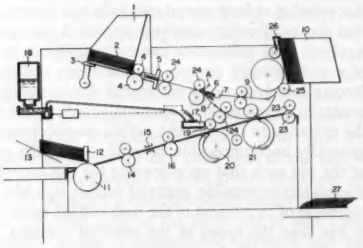
1. Apparatus for printing and applying pressure sensitive labels, comprising: means for mounting a roll of pressure sensitive labels carried on a web of supporting material, means for printing on the labels, means downstream of the printing means for delaminating the printed labels from the supporting material web, means defining a path for the label web from the supply roll to the delaminating means, means for advancing the web to the printing means and to the delaminating means, the roll mounting means comprising a reel and a shaft for rotatably mounting the reel, the reel having a disc, a hole in the disc for receiving the shaft, a hub rotatably mounted on the shaft but separate from the disc for mounting the roll, and means for keying the hub to the disc so that the hub and the disc rotate as a unit, the hub having outwardly extending spring fingers extending through a hole in the roll and exerting outward pressure on the inside of the roll.

4,092,919

CARD SELECTING AND ADDRESS PRINTING APPARATUS

Kenzo Araya, and Takashi Hashimoto, both of Tokyo, Japan, assignors to Tanaka Seiki Co., Ltd., Tokyo, Japan

Filed May 5, 1975, Ser. No. 574,251
Claims priority, application Japan, May 7, 1974, 49-50552
Int. Cl.[2] B41L *47/46*
U.S. Cl. 101—53 3 Claims



1. A card selecting and address printing apparatus for selecting a card having specified information from among a group of cards bearing thereon coded information and for transfer-printing said specified information from said card onto a sheet of paper comprising:

a card hopper to receive therein a group of cards including the cards to be selected and those not to be selected;

a card feeder for feeding the cards, from the card hopper, one at a time at a predetermined time interval;

an optical card reading and signal generating means, stored with specified information, which reads the coded information on a card fed by the card feeder, compares it with the stored specified information, and generates a first signal accordingly which will render said card either a selected or a non-selected card depending upon whether or not said card has information thereon which corresponds to the specified information of said optical means and which generates a second signal for actuating said card feeder at a shorter time interval than said predetermined time interval for feeding a subsequent card when said read card is a non-selected card, to ensure rapid feeding of the cards in such cases;

a card path selecting mechanism which selects a card path according to said first signal generated at the optical card reading and signal generating means so as to transport said selected card along a printing path or said non-selecting card along a non-printing path, respectively;

a workpiece hopper accommodating therein papers on which said specified information is to be transfer-printed;

a workpiece feeder for feeding said papers one at a time successively along a paper feeding path from the workpiece hopper to a waiting station provided adjacent to a printing station of the paper and for subsequently feeding the paper to the printing station in response to the third signal generated from the optical card reading and signal generating means when said read card is a selected card while simultaneously feeding the next paper to the waiting station;

said workpiece feeder including first and second paper feeding rollers along said paper feeding path, the first roller being mounted under the work piece hopper, the second roller being disposed at a distance from the first roller which is less than or equal to the length of said paper, and the circumferential velocity of the second roller being higher than that of the first roller, so as to maintain an appropriate distance between the papers fed along the paper feeding path;

a paper position sensing and timing device for generating a fourth signal for stopping said workpiece feeder in order to stop the workpiece at said waiting station at a preselected constant time interval after said paper is sensed by said paper position sensing and timing device;

printing means disposed at said printing station which pressedly transfer-prints said specified information on the selected card fed through the card path selecting mechanism and the printing path onto the paper fed from the workpiece feeder along said paper feeding path;

a card stacker; and

a card stacking roller which catches the cards fed through the printing path and through said non-printing path and stacks them in the card stacker in the same order as they were held in the card hopper.

4,092,920

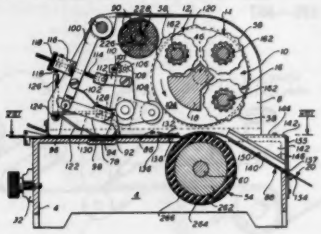
DOCUMENT IMPRINTER

John A. Barnak, Stamford, Conn., assignor to Litton Business Systems, Inc., Paramus, N.J.

Continuation of Ser. No. 522,955, Nov. 11, 1974, abandoned, and Ser. No. 522,956, Nov. 11, 1974, Pat. No. 4,027,585, and Ser. No. 522,957, Nov. 11, 1974, Pat. No. 4,008,663, and Ser. No. 522,958, Nov. 11, 1974, Pat. No. 4,018,156. This application Nov. 10, 1976, Ser. No. 740,562
Int. Cl.[2] B41U *1/44*
U.S. Cl. 101—77 9 Claims

1. In an imprinter having printing means comprising a rotary printing unit, said rotary printing unit including at least two banks of printing members, said banks being each respectively disposed at different angular locations about the axis of rota-

tion of said rotary printing unit, each printing member having a plurality of type faces any one of which is adapted to be selected for printing; means for selecting any one of said type faces of each printing member for printing; a cylindrical platen cooperable with said banks of printing members and defining therewith a printing nip; means for feeding to said printing nip a web of label material to be printed on by said type faces, said web of label material comprising labels carrying a coating of pressure sensitive adhesive, said web of label material further comprising a carrier strip to which said labels are releasably secured by said pressure sensitive adhesive; said cylindrical platen comprising:



an exterior portion;

an underlying portion of elastomeric material;

said exterior portion being made of a synthetic resinous material, and being thinner and harder than said underlying elastomeric material portion, said synthetic resinous exterior portion presenting an outermost surface which is substantially smooth and glossy and substantially non-adherent to said pressure sensitive adhesive carried by said labels;

whereby said synthetic resinous exterior portion minimizes and retards deposition of the pressure sensitive adhesive from the labels onto the platen.

4,092,921

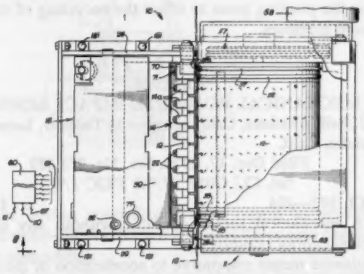
HIGH SPEED PRINTER MODULE

Andrew M. McInnis, Covina, and Robert A. Nielsen, Pasadena, both of Calif., assignors to Sheldon-Sodeco Printer, Inc., Elmsford, N.Y.

Filed May 27, 1976, Ser. No. 690,579

Int. Cl.[2] B41J *1/32*

U.S. Cl. 101—93.21 **6 Claims**



1. In impact printer apparatus operable to rapidly print characters on a print sheet in lines and columns, and including:

a first assembly including a continuously rotating rotary print drum having an axis of rotation, a second assembly including hammer means, a print transfer medium and carrier therefor, the improvement comprising:

support means supporting said assemblies in spaced relation to provide a print sheet receiving slot between the drum at one side of the slot and local extent of said transfer medium and hammer means at the opposite side of the slot, said assemblies being generally spaced transverse to said axis or rotation, and said slot extending between the assemblies parallel to said axis of rotation and being open-ended, print sheet advancing means associated with said first assembly to advance an endwise feedable print sheet endwise beneath the drum and then upwardly in the slot, the support means including first and second side plates at opposite sides of the slot, the drum located between the first side plates, said print sheet advancing means including a pair of rotors rotatable about said drum axis at opposite ends of the drum and between the first side plates, and rotor drive means including ratchet means operable to rotatably index said rotors, said ratchet means includes a circular series of ratchet teeth on at least one of the rotors, said teeth projecting inwardly toward the drum axis, at least one actuator arm having rotatably reciprocating ratchet engagement with said teeth, and said drive means includes a motor operatively connected with said arm to rotatably reciprocate the arm.

4,092,922

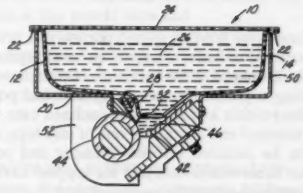
LITHOGRAPHIC INK SUPPLY

Roy C. Schweitzer, Barrington, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 599,158, Jul. 25, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 765,059

Int. Cl.[2] B41L *25/12*

U.S. Cl. 101—363 **1 Claim**



1. A method of maintaining a substantially constant volume of ink on a fountain roller of a lithographic duplicating machine having an ink fountain including a fountain roller, and a support means above the fountain comprising the steps of:

(a) providing an ink package comprising a disposable container body containing a supply of operative lithographic low viscosity ink and including dispensing opening means to permit flow of ink when the dispensing opening means is exposed to the atmosphere, the dispensing opening means comprising a substantially linear opening array suited for disposition parallel to the fountain roller axis, the opening array including no opening smaller than one-half square inch in area or smaller than three-eighths inch in minimum dimension, and being so arranged as to present a portion of an opening within two inches measured axially from any portion of the fountain roller, a cover overlying the container body and sealed thereto, the container body and cover being made of nondeflectable, nonshiftable elements and being free of access passages other than said dispensing opening means, and readily removable closure means for sealing the dispensing opening means to prevent flow of ink during storage of the ink package;

(b) removing the closure means from the ink package and placing the ink package on the support means with the dispensing opening means facing downwardly and with the opening array parallel to the fountain roller axis and spaced above the ink support surfaces of the fountain by at least about one quarter inch such that the ink flows directly into the fountain and against the fountain roller forming an elongate bead of ink which increases in size until it blocks exposure of the dispensing opening means to

the atmosphere and shuts off flow of ink from the container body;

(c) maintaining substantially constant the volume of the bead of ink by spontaneous replenishment in response to exposure of the dispensing opening means to the atmosphere as the volume of the bead of ink is diminished during duplicating operation;

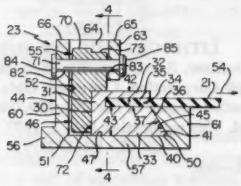
(d) removing and discarding the ink package from the machine when the supply of ink in the container body is exhausted.

4,092,923

PRINTING BLANKET HOLDING APPARATUS

Jacob A. Bollmer, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Mar. 1, 1977, Ser. No. 773,239
Int. Cl.² B41F *27/12*
U.S. Cl. 101—415.1 **14 Claims**



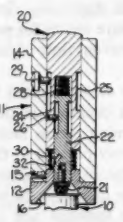
1. Apparatus for holding an end portion of a printing blanket on an associated cylinder comprising; an elongate holding bar of roughly U-shaped cross-sectional outline having a pair of legs defining a groove for receiving said end portion of said blanket therewithin and having an inclined cam surface comprising a terminal end portion of one of said legs; a bar support adapted to be installed on said cylinder and receiving said holding bar therewithin with said bar support having a cooperating supporting surface for receiving said cam surface thereagainst; and double eccentric means for attaching and detaching said holding bar relative to said bar support; said double eccentric means comprising, a support shaft carried by said bar support, a comparatively large first disc eccentrically mounted on said shaft providing locking action for retaining said cam surface against said supporting surface, and a second disc smaller than said first disc and being also eccentrically mounted on said shaft providing clamping action of said bar within said bar support perpendicular to said locking action, said discs being rotatable to enable attaching and detaching of said holding bar.

4,092,924

METHOD FOR IDENTIFYING THE LOAD CHARACTERISTICS OF A CENTERFIRE FIREARM CARTRIDGE

John H. Edmisten, P.O. Box 201, Boone, N.C. 28607

Division of Ser. No. 692,844, Jun. 4, 1976. This application Apr. 4, 1977, Ser. No. 784,578
Int. Cl.² B41F *17/00*
U.S. Cl. 101—426 **6 Claims**



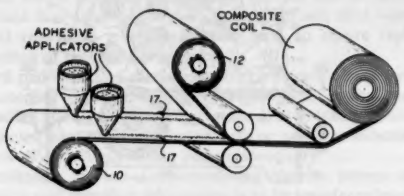
1. A method of loading a centerfire firearm cartridge while identifying the load characteristics thereof comprising inserting an unstruck primer into a primer pocket in the cartridge head, and thereafter imprinting onto the unstruck primer indicia identifying the load characteristics of the loaded cartridge.

4,092,925

LITHOGRAPHIC PRINTING PLATE SYSTEM

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06066

Filed Aug. 5, 1976, Ser. No. 711,930
Int. Cl.² B41C *1/10*; B32B *7/14*
U.S. Cl. 101—467 **3 Claims**



1. Method for making composite lithographic substrates having an aluminum printing member which is recyclable, comprising:

providing a continuous web of carrier material having a given width;

providing a continuous aluminum web having the same width as the carrier web and a central longitudinal portion defining an image area;

continuously applying a releasable adhesive on at least one of the carrier web and the aluminum web along at least two longitudinal lines disposed outside of the image area;

releasably adhering the two webs along the longitudinal lines to form a composite web;

transversely cutting the composite web to form discrete printing plates wherein the carrier and aluminum portions for a plate have the same length;

applying a light sensitive coating on the aluminum member of the discrete plate and exposing and developing the light sensitive coating in the image area thereof;

mounting the discrete plate on a printing press; and

separating the aluminum member from the carrier after use on the printing press to effect the recycling of the aluminum members.

4,092,926

MECHANICAL ROLAMITE IMPACT SENSOR

Lon E. Bell, Altadena, Calif., assignor to Technar, Incorporated, Arcadia, Calif.

Filed Dec. 17, 1976, Ser. No. 751,859
Int. Cl.² G01P *15/02*; F42C *1/00*
U.S. Cl. 102—204 **12 Claims**

1. A mechanical sensor operable without any source of electrical energy comprising:

a rolamite means responsive to acceleration or deceleration above a predetermined amount;

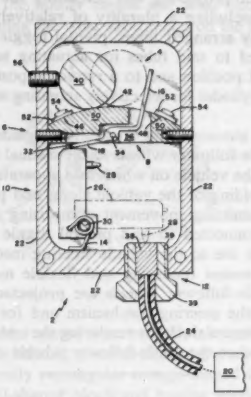
a support means upon which said rolamite means is mounted for supporting said rolamite means and providing a path of movement for a portion of said rolamite means during said acceleration or deceleration above a predetermined amount;

a trigger means located adjacent to said support means, said trigger means comprising a first portion extending into said path of movement of a portion of said rolamite means, a second portion which extends to a hammer means and a pivot point located between said first and second portions, said trigger means being movable in response to move-

ment of said rolamite means as a result of said acceleration or deceleration;

said hammer means located adjacent to said trigger means and releasable by said second portion of said trigger means upon movement of said trigger means;

a primer means activated by said hammer means;



a biasing means for moving said hammer means towards said primer means, to activate said primer means as a result of said acceleration or deceleration; and a housing for enclosing said rolamite means, said support means, said trigger means, said hammer means, and said biasing means.

4,092,927

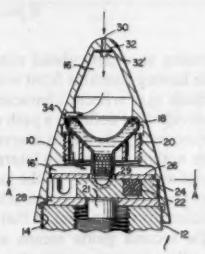
DELAY ARMING MECHANISM FOR FUZES

Roy E. Rayle, Richmond, Ind., assignor to Avco Corporation, Wilmington, Mass.

Filed Nov. 14, 1968, Ser. No. 775,809

Int. Cl.[2] F42C *15/26, 15/28*

U.S. Cl. 102—229 **4 Claims**



1. A fuze having controlled arming means to provide a preselected delay interval for use on either fin or spin stabilized projectiles comprising:

an ogive of generally conical configuration formed with an apex, said ogive defining a chamber therein;

an orifice formed at the apex of said ogive providing communication between the external fluid environment through which the projectile travels and the ogive chamber;

an initiator;

a support member mounting said initiator in said ogive chamber wherein said initiator divides said chamber into a first and second chamber, said first chamber being in communication with said orifice;

said support member defining a plurality of passageways providing communication between said first and second chamber;

a transversely extending carrier mounted for transverse displacement relative to said ogive in response to a transverse force, said carrier being mounted in the end opposite the apex;

a detonator mounted in said carrier for movement therewith;

pressure releasable locking means for normally locking said carrier in an unarmed state but responsive to pressure increases within the first and second chambers to release said locking means thereby permitting transverse movement of said carrier to an armed state,

said pressure releasable locking means including a locking member acting on each side of said carrier, each of said members comprising

a cylinder,

a piston mounted in said cylinder for telescopic movement therewith wherein the end of said piston is in communication with said second chamber, and

a spring coacting between said cylinder and piston urging said piston into locking engagement with said carrier wherein pressure increases in said first and second chamber due to fluid entering said chambers through said orifice will act on said piston whereby the controlled build-up of pressure acting on said piston to overcome the spring force provides a preselected delay interval causing the controlled

arming delay from the unarmed to the armed state;

second locking means mounted in said carrier for locking said carrier in the armed state and

releasable seal means cooperatively associated with said orifice to separate said first chamber from the external environment prior to the firing of said projectile, thereby providing an additional operational delay for arming.

4,092,928

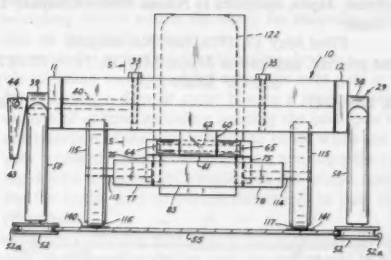
TRAVELING SUPPORT APPARATUS

Edward A. Clavin, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Jan. 17, 1977, Ser. No. 759,781

Int. Cl.[2] B61B *13/04*; E01B *25/08*

U.S. Cl. 104—119 **9 Claims**



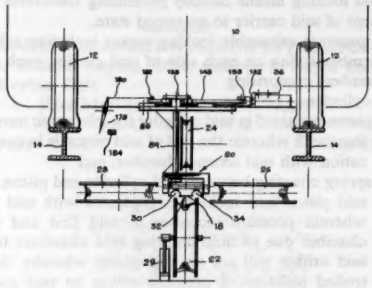
1. Traveling apparatus, comprising body means having oppositely disposed pairs of wheel means adapted to engage oppositely outwardly facing uniformly spaced edges of track means, and endless belt drive means supported by said body means adapted to engage said track means to propel said traveling apparatus along said track means, each of said oppositely disposed pairs of wheel means being supported by a cross shaft assembly having telescoped shaft elements biased to elongate by spring means disposed therebetween and including control means operable to compress said spring means to shorten said shaft assembly to move said wheel means against said opposite edges of said track means, said control means also being operable to relieve said compression of said spring means whereby said shaft assembly is lengthened to space said wheel means from said opposite edges of said track means.

4,092,929

TRANSPORT INSTALLATION WITH TRIPLE GRIP FOR COUPLING THE VEHICLES TO HAULAGE CABLES

Roger Laurent, Chambery, France, assignor to POMA 2000 S.A., France

Filed Dec. 13, 1976, Ser. No. 750,143
Claims priority, application France, Dec. 31, 1975, 75 40392
Int. Cl.[2] B61B 9/00
U.S. Cl. 104—173 R 9 Claims



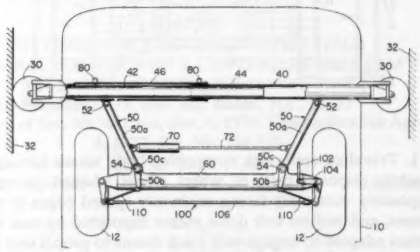
2. A transport installation comprising passive individual vehicles, a track on which the said vehicles run, haulage cables extending along the said track, a grip carried by each vehicle to couple the vehicle on to said cables, said grip having two cheeks mobile in relation to each other, and each having three jaws to form three pairs of jaws of which the jaws of each pair belong to different cheeks, a relative movement in one direction of the said cheeks resulting in the opening of one pair of jaws and the closing to the two others and a movement in the opposite direction resulting inversely in the closing of one pair of jaws and the opening of the two others.

4,092,930

GUIDE FOLLOWABLE AND MANUALLY STEERABLE VEHICLE OF A TRANSPORTATION SYSTEM

Tooji Takemura; Shigeru Saitoh, and Mitsuharu Hamada, all of Yokohama, Japan, assignors to Nissan Motor Company Limited, Japan

Filed May 13, 1976, Ser. No. 686,084
Claims priority, application Japan, May 19, 1975, 50-58739
Int. Cl.[2] B62D 1/26
U.S. Cl. 104—247 2 Claims



1. In combination, a vehicle having a steering mechanism driveable on highways and roads, an apparatus for converting the vehicle for use on a guide track system comprising,

a set of guide-follower wheels having vertical axes of rotation,

means for movably mounting said guide-follower wheels on said vehicle for selective travel on a guide track system having laterally spaced guide surfaces relative to a path the vehicle is to travel and for following the guide surfaces under automatic control of the guide-follower wheels,

means for selectively projecting the guide-follower wheels outwardly laterally of the vehicle for engagement in use on the guide surfaces laterally of a path of travel the vehicle is to travel and for retracting the guide-follower wheels to a retracted position under the vehicle, said means for projecting and retracting the guide-follower wheels including a plurality of relatively slidable, telescopically arranged tubes, pivotal toggle arms pivotally connected to said tubes for actuating said tubes to an extended position and to a retracted position, and a hydraulic cylinder for selectively actuating said toggle arms, and

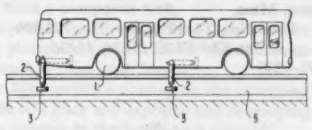
means for automatically transmitting guide movement of said guide-follower wheels to the manual steering mechanism of the vehicle on which said apparatus is mounted to effect guiding of the vehicle along said path, said means for transmitting movement comprising flexible control means connected to said pivotal toggle arms and connected in use to the vehicle steering mechanism and including means rendering said flexible means taut when said guide-follower wheels are projected to effectively operate the steering mechanism and for rendering said flexible means slack for rendering the control means ineffective when the guide-follower wheels are retracted.

4,092,931

POSITIVE GUIDE MECHANISM FOR ROAD VEHICLES WITH NON-TURNABLE WHEELS

Helmut Wulf, Nellingen, and Klaus Niemann, Weinstadt-Endersbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 5, 1976, Ser. No. 664,372
Claims priority, application Germany, Mar. 6, 1975, 2509713
Int. Cl.[2] B61F 9/00
U.S. Cl. 104—247 7 Claims



1. A system comprising an unarticulated road vehicle provided with a front axle having steerable front wheels and a rear axle having non-steerable rear wheels, characterized in that a first guide means is provided for defining a path or travel of the road vehicle, a single second guide means is arranged pairwise and mutually opposite within an area of a lateral periphery of the road vehicle at least approximately at the same distance in front and to the rear of the non-steerable rear wheels as viewed in the vehicle longitudinal direction, and in that the first guide means and said single second guide means are operatively associated with each other so as to positively guide said non-steerable rear wheels such that a rolling plane of the rear wheels is always disposed substantially at a right angle to radii of curvature of a curved path traversed by the non-steerable rear wheels whereby said rear wheels are free of oblique running and lateral forces.

4,092,932

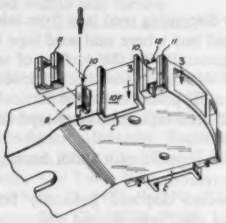
REPLACEABLE BOLSTER GIB ARRANGEMENT

Robert W. MacDonnell, Crete, Ill., assignor to R. W. Mac Company, Crete, Ill.

Filed Jul. 26, 1976, Ser. No. 708,900
Int. Cl.[2] B61F 5/04, 5/50; F16C 17/00, 25/02
U.S. Cl. 105—207 11 Claims

1. In a railway truck bolster structure having side wall structure adjacent each end region for controlled movement between confronting truck side column structures, an improved

bolster guide arrangement comprising holder means fixed to and projecting from the bolster side wall structure in flanking spaced relation to the corresponding side column structure, wear shoe means seated on the holder means in force transmitting relation to cooperate with the side column structure in limiting relative horizontal movement between the bolster and side column structures, and interlocking means captively engaged between the holder means and wear shoe means for removably retaining the wear shoe means on the holder means



wherein said holder means is a vertically elongated generally U-shaped block defining a vertical passage, said wear shoe means is a generally rectangular trough-shaped hollow block embracing the U-shaped block and having vertical side wall means interconnecting upper and lower end wall portions to define a central pocket complementary to the U-shaped block, and said interlocking means projects through the passage of the U-shaped block and overlaps end wall portions of the trough-shaped block to hold the blocks in direct force transmitting relation.

4,092,933

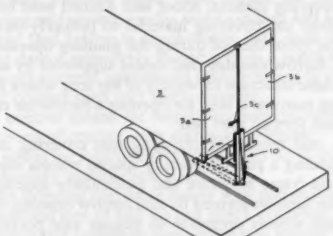
BRACING DEVICE

Thomas Charlton, 13931 S. Stoneshire, Houston, Tex. 77037

Continuation-in-part of Ser. No. 585,083, Jun. 9, 1975, abandoned. This application Oct. 14, 1975, Ser. No. 622,125

Int. Cl.² B65J *1/22*

U.S. Cl. 105—366 R **20 Claims**



1. In a bracing means for wedging closed the door of a contained cargo on a transporting vehicle so as to preclude pilferage and spillage from the container comprising:

an upstanding member and a base member in unitary construction, the construction adapted to be hingedly affixed to the transporting vehicle proximate the base member so that the bracing means can be tipped to a stowed position on vehicle floor, and

biasing means affixed to the base member of the bracing means for urging the upstanding member toward a contacting position with the door of the contained cargo, so as to exert pressure thereon when abutting contact is made.

4,092,934

APPARATUS FOR USE IN DEPOSITING ARTICLES IN A RECEPTACLE AND A SEQUENCE CONTROLLER UTILIZED THEREIN

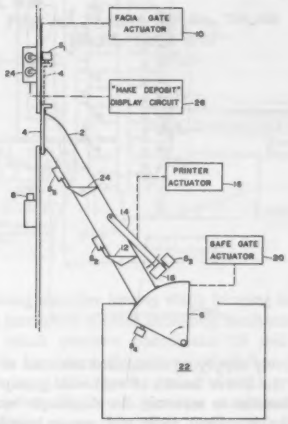
Trevor Anthony Sayer, Croydon, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,897

Claims priority, application United Kingdom, Mar. 15, 1974, 11611/74

Int. Cl.² G07G *5/00*

U.S. Cl. 109—24.1 **11 Claims**



1. Apparatus for use in depositing articles, such as bank deposit envelopes, in a receptacle, comprising:

a chute having an inlet through which the articles are inserted and an outlet through which the articles exit into the receptacle;

a mechanical gate at the inlet of the chute;

a mechanical gate at the outlet of the chute;

an actuator for each of the inlet and outlet gates for opening and closing same;

a recording device within the chute for recording information on the article therein;

an actuator for actuating the recording device;

cycle initiating means enabled when the inlet gate is closed for initiating a deposit cycle having a predetermined sequence of actions including opening the inlet gate to permit insertion of the article into the chute while the outlet gate is closed, closing the inlet gate, actuating the recording device to record information on the article, and opening the outlet gate to permit the article to pass into the receptacle;

a sequence controller controlling the actuators of the inlet gate, the recording device, and the outlet gate to enforce said predetermined sequence of actions in the deposit cycle within specified time periods;

and error detecting means terminating the deposit cycle at any stage thereof in which there occurs an action deviating from said predetermined sequence or not within a time period specified in the sequence.

4,092,935

PROCESS AND APPARATUS FOR THE INCINERATION OF SOLID FUEL MATERIAL

Charles E. Barnabe, Birmingham, Ala., assignor to Passavant Corporation, Birmingham, Ala.

Filed Mar. 28, 1977, Ser. No. 781,979

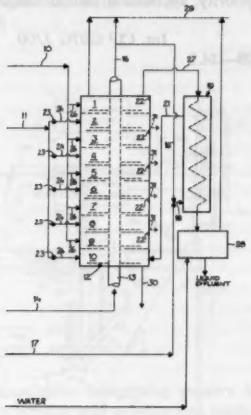
Int. Cl.² F23G *7/00*

U.S. Cl. 110—186 **11 Claims**

1. A process for the combustion of solid waste material

containing combustibles in a gravity-type furnace having multiple groups of superimposed hearths, the improvement comprising:

(a) feeding solid waste material into the upper hearth of each said group of superimposed hearths so that said material is preheated, dried and burned within said group of superimposed hearths,



(b) selectively supplying controlled amounts of an auxiliary fuel to the lower hearth of each said group of superimposed hearths to maintain the discharge temperature of gases flowing from each said upper hearth above the ignition temperature of said gases, and

(c) removing ash from the lower hearth of at least the lowermost group of superimposed hearths.

4,092,936

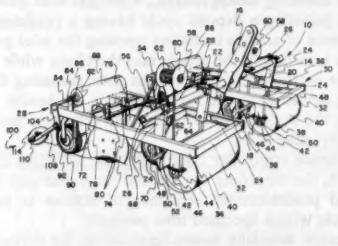
METHOD AND APPARATUS FOR SEED TAPE PLANTING

J. Curtis Griffin, and Clyde C. Griffin, both of Branford, Fla., assignors to Harrington Manufacturing Co., Lewiston, N.C.

Filed Jun. 24, 1976, Ser. No. 699,585

Int. Cl.[2] A01C *7/00*; A01G *13/02*

U.S. Cl. 111—1 **14 Claims**



1. An automatic seed tape planter for field planting seed tape, comprising:

A. a mobile frame structure having connecting means associated therewith for connecting the frame structure thereof to a tractor such that said planter can be pulled through a field by said tractor during the planting operation;

B. means mounted about the front of said frame structure for forming a seed bed about a top portion of the soil within the field being traversed by said planter, said seed bed forming means including:

B1. roller means rotatively mounted forwardly within said frame structure about a transverse axis;

B2. said roller means including an outer cylindrical surface for engaging the underlying soil as said planter is pulled through the field by said tractor such that the engagement of said outer cylindrical surface with the underlying soil results in the formation of said seed bed; and

B3. cleaning blade means associated with said seed bed forming means and normally maintained in engagement with the outer cylindrical surface of said roller means for continuously cleaning said cylindrical surface during the planting operation;

C. means for dispensing seed tape from said planter to said formed seed bed where said seed tape is appropriately disposed generally on the surface of said seed bed or embedded within the seed bed in accordance with accepted planting practices for the particular type of seeds within said seed tape, said seed tape dispensing means including:

C1. means for supporting a spool having said seed tape wound therearound;

C2. guide means disposed generally below said spool having said seed tape wound therearound, said guide means being spaced vertically above said formed seed bed and having said seed tape threaded therethrough such that as the seed tape is dispensed in the planting operation the seed tape moves through said guide means; and

C3. wherein there is provided wheel means supported by said frame structure rearwardly of said guide means for passing over said seed tape once the same is engaged with the underlying soil and applying a downward force to generally hold the seed tape about the formed seed bed so as to allow the seed tape to freely unwind from the spool thereof as said planter moves through the field during the planting operation; and

D. means for laying a covering material over said formed seed bed and the dispensed seed tape for protecting the seeds and resulting seedlings for a time period after planting said seed tape, said means for laying said covering material including:

D1. means associated with said frame structure for supporting a spool of covering material about a transverse axis rearwardly of said seed tape dispensing means;

D2. means for engaging said covering material and pressing the same against the underlying soil during the seed tape planting operation so as to generally hold the covering material about said formed seed bed so as to allow the covering material to properly unwind from the spool thereof during the planting operation;

D3. furrow opening disc means supported by said planter frame structure forwardly of the area where said covering material is laid, for opening a furrow on each side of said formed seed bed;

D4. said means for engaging said covering material including a pair of laterally spaced wheels supported by said frame structure and particularly spaced to run in the furrows formed by said furrow opening disc means, said wheels operative to engage side portions of said covering material dispensed from said spool and to press the same into said furrows; and

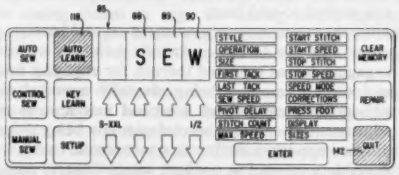
D5. back filling means carried by said planter frame structure generally rearwardly of said pair of wheels for back filling portions of the soil displaced from said furrows back into said furrows and over the side portions of said covering material such that the back filled soil tends to hold down said covering material about said seed belt, said back filling means comprising a pair of laterally spaced floating disc assemblies carried by said frame structure about the rear thereof, each floating disc assembly engagable with a mound of dirt displaced from a respective furrow and disposed adjacent thereto so as to urge a portion of the displaced soil back into said furrow, each of said floating disc assemblies including:

1. pivot plate means rotatably mounted about a transverse axis to said frame structure;
2. arm means secured to said pivot plate means and extending generally rearwardly therefrom; and
3. disc means secured to a remote end of said arm means opposite the end thereof which is connected to said pivot plate means, said disc means being angled so as to engage and urge soil disposed adjacent a respective furrow back into said furrow and generally over a respective side portion of said covering material disposed within said furrow.

4,092,937
AUTOMATIC STITCHING BY PROGRAMMABLE SEWING MACHINE

John Vernon Landau, Jr.; Barney Dean Hunts, both of Mountain Lakes; Frederick Alexander Rupinski, Lynhurst, and Alfred John Zenger, Montville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,890
Int. Cl.² D05B *19/00*
U.S. Cl. 112—121.11 **28 Claims**



1. A programmable sewing system adapted to perform a sequence of operations on a work material, said programmable sewing system comprising:

a sewing machine having a frame;

a sewing needle supported within said frame for selectively repeated movement from a down position through a work material to an up position and returned to a down position;

a looptaker supported within said frame for cooperation with said sewing needle in the formation of stitches;

a reversible work material feed system supported within said frame and including feeding means for passing work material in a path between said needle and said looptaker;

continuously variable speed drive means for selectively actuating said sewing needle, said looptaker and said work material feed system in synchronism with each other;

a presser device selectively movable from a position urging said work material against said feeding means to a position out of contact with said work material;

manual control means for selectively moving said presser device out of contact with said work material;

treadle means for selectively actuating said drive means to a continuously variable sew speed;

means for stopping said drive means with said sewing needle in a selected one of said up and down positions;

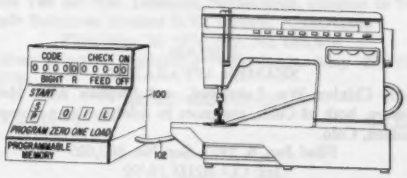
a programmable computer coupled to said sewing machine and including means for counting said selectively repeated movement of said sewing needle in effecting stitches upon selective actuation of said treadle means, means for measuring the time duration of said presser device in a position out of contact with said work material while said sewing needle is in a selected down position after the completion of at least one stitch, means for obtaining a copy of said continuously variable sew speed actuated by said treadle means, and means for automatically recording in a first mode of operation upon reactuation of said treadle means the stitch count, any one time duration and variable sew speed copy of a segment in said sequence of operations on a work material;

said programmable sewing system having a second mode of operation utilizing said treadle means as an ON/OFF switch to actuate in the ON position of said sewing machine in accordance with the record from said recording means obtained in said first mode of operation and in the OFF position permitting operation of selected components of said sewing machine.

4,092,938
SEWING MACHINE WITH PROGRAMMABLE MEMORY

Donald Jay Coughenour, Morristown, and John Addison Herr, Garwood, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 27, 1976, Ser. No. 709,048
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 E **14 Claims**

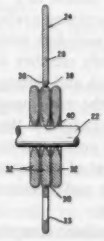


1. In a sewing machine having stitch forming means operative to form successive stitches including mechanism for influencing the stitch position coordinates of said successive stitches in the formation of a pattern of stitches, logic means responsive to input data representative of stitch position coordinates for producing stitch position coordinate electrical signals, actuating means responsive to signals from said logic means for controling the position of said stitch forming means in accordance with input data fed to said logic means, and re-programmable programming means operably connected to said sewing machine, said programming means including operator manipulating means for generating stitch by stitch digital input data corresponding to a stitch pattern selected by the operator and read-write static memory means continuously available for storing said digital input data while connected to said sewing machine and for transmitting electrical digital output signals corresponding to the stitch pattern selected by the operator to said logic means such that an operator may select a stitch pattern program for entry into the sewing machine for automatic reproduction of the stitch pattern by the sewing machine.

4,092,939
TENSION DISC ASSEMBLY

Warren Dean Knowles, Clark, N.J., assignor to The Singer Company, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,291
Int. Cl.² D05B *47/00*
U.S. Cl. 112—254 **6 Claims**



1. A tension disc assembly, for use in a tension device in

conjunction with individual, uniformly shaped tension discs, comprising:

one of said uniformly shaped tension discs;

a rigid flat plate having an aperture therethrough, said aperture having a shape congruent to the shape of said one tension disc; and,

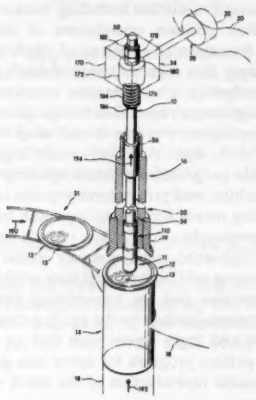
means for mounting said one tension disc within said aperture whereby said plate augments the size of said one tension disc enabling said plate with said one tension disc mounted therein to be used as an assembly both for guiding thread into said tension device and for tensioning thread therein.

4,092,940

SEAMER APPARATUS

Samuel Chinlun Wu, Lakewood, and Stephen Alan Holick, Aurora, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Jun. 6, 1977, Ser. No. 803,605
Int. Cl.[2] B21D *19/00*
U.S. Cl. 113—29 **19 Claims**



1. In apparatus for seaming a can end member on a can body member and comprising:

end member transfer means for causing movement of an end member to a "make-up" station;

can body member transfer means for causing movement of a can body member to the "make-up" station and for effecting supportive engagement of the can body member with the can end member and for causing movement of the can body member and the end member supported thereby from the "make-up" station to a "seamer" station;

control rod means for applying a relatively light holding and stabilizing force on said end member during supportive association of the body member with the end member at the "make-up" station and during movement of the can body member and the end member supported thereby from the "make-up" station to the "seamer" station;

cam means operatively connected to said control rod means for causing movement of said control rod means between an extended position and a retracted position relative to the end member; and

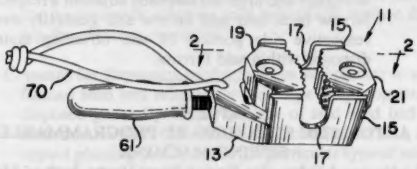
the improvement of resilient compressible force application controlling means mounted on said control rod means for engaging the upper surface of the end member and limiting the amount of force applied to the end member.

4,092,941

ADJUSTABLE TWO-WAY CAM CLEAT

Stephen Gryglas, 1874 Fenton La., Park Ridge, Ill. 60068

Filed Mar. 21, 1977, Ser. No. 779,308
Int. Cl.[2] B63B *21/08*
U.S. Cl. 114—218 **6 Claims**



1. An adjustable cam cleat particularly adapted for releasably holding lines of different diameters against axial tension exerted on said lines in opposite axial directions, comprising:

a base;

a first cam jaw having an arcuate periphery with first engaging means mounted thereon for engaging a line, said first cam jaw being pivotally mounted on said base about a first axis normal to said base;

adjustment means movably mounted on said base;

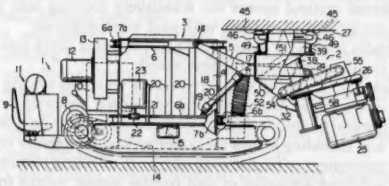
a second cam jaw having an arcuate periphery with second engaging means mounted thereon for engaging said line, said second cam jaw being pivotally mounted on said adjustment means about a second axis normal to said adjustment means, said second cam jaw being disposed a distance opposite said first axis, said second cam jaw being movable with said adjustment means linearly relative to said first axis to vary said distance therebetween for accommodating lines of different diameters between said first and second cam jaws, whereby said first and second engaging means engage said line disposed between said first and second cam jaws and cooperate to hold said line from movement in opposite axial directions.

4,092,942

MOBILE SHOT BLASTING APPARATUS FOR SHOT BLASTING THE BOTTOM OF A SHIP OR THE LIKE

Sinichi Kurohiji, Tanashi; Genshichi Shigyo, Mitaka, and Nobujiro Arai, Yokohama, all of Japan, assignors to Magster Company, Japan

Filed Jul. 5, 1977, Ser. No. 812,524
Int. Cl.[2] B60S *3/02*
U.S. Cl. 114—222 **19 Claims**



1. In a mobile shot blasting apparatus for the bottom surface of a ship;

a tractor;

dust collecting means disposed in the tractor;

support means operatively mounted on the tractor having an arm which is vertically pivotably and horizontally rotatable about the tractor;

shot blasting means pivotably mounted on the end of the arm and fluidly connected to the dust collecting means for transfer of dust and debris from the shot blasting means;

shot accelerating means operatively disposed in the shot blasting means for directing shot at a predetermined angle;

a hopper disposed in the shot blasting means and arranged to collect the shot and debris reflected and disloged from the surface;

separating means arranged in the hopper to separate the shot from the dust and debris and direct the dust and debris to the dust collecting means and the shot to the bottom of the hopper;

a first conveyor means disposed at the bottom of the hopper to convey the shot collected therein through an opening, closably by gate means, formed in the bottom of the hopper into a supply chute;

a second conveyor means operatively connected to the shot accelerating means, which communicates with the supply chute to convey shot therein into the shot accelerating means;

the improvement comprising:

box means disposed in the upper portion of the shot blasting means and provided with through holes in the upper and lower surfaces thereof to permit therethrough the passage of high velocity shot from the shot accelerating means;

casing means slidably disposed in the box means which has through holes formed in the upper and lower surfaces thereof to permit therethrough the passage of high velocity shot from the shot accelerating means;

urging means operatively connected to the box means and the casing means to urge the casing means upwardly against the weight of the casing means so that the casing means is slidable in the box means via the application of a small force;

magnetic means disposed on the upper portion of the casing means to attract and hold the casing means against the surface to be shot blasted and;

roller means mounted on the upper portion of the casing means to contact the surface and maintain a predetermined gap between the upper surface of the magnetic means and the surface to be shot blasted.

4,092,943

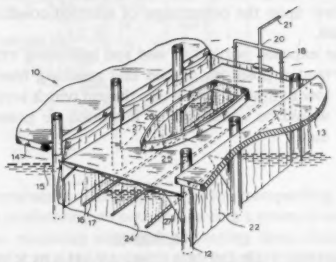
MARINE PROTECTION SYSTEM

Norman Lund, and George R. Young, both of 6525 New Haven, Melbourne, Fla. 32901

Filed Jul. 19, 1976, Ser. No. 706,299

Int. Cl.[2] B63C *1/00*; E02C *3/00*

U.S. Cl. 114—222 **2 Claims**



1. A marine growth retardation system comprising in combination:

a marine structure located at least partially in water and having pilings to form a boat slip for housing a boat therein;

gas diffuser means located adjacent said marine structure below the water level for feeding and dispersing gas fed thereto, said gas diffuser means being mounted to the sea bed in said boat slip directly beneath the mooring position of a boat;

ozone generator means coupled to said gas diffuser means for directing ozone therethrough and to the surrounding water;

skirt means set vertically in the water adjacent said marine structure to restrict the flow of water therepast, said skirt means having a plurality of skirts removably attached to the pilings for said boat slip whereby ozone treated water adjacent said skirt means will prevent marine growth from fouling marine structures; and

a removable cover adapted to fit over said boat slip and having an opening therein for a boat to fit thereinto in said boat slip, said opening in said top cover having a raised wall extending therearound for directing ozone gas passing therethrough.

4,092,944

UNDERWATER ANCHOR FOR THE MOORING OF FLOATING STRUCTURES AS WELL AS A METHOD FOR THE PLACING OF SUCH AN ANCHOR

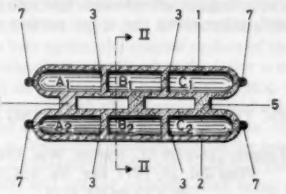
Siemen Van der Wal, Lunteren, Netherlands, assignor to Verenigde Bedrijven Bredero N.V., Utrecht, Netherlands

Filed May 20, 1976, Ser. No. 688,486

Claims priority, application Netherlands, May 29, 1975, 7506376

Int. Cl.[2] B63B *21/24*

U.S. Cl. 114—297 **5 Claims**



2. A method for placing a floatable anchor having a body with a closed hollow interior and a fastening point for an anchor cable, into the bottom of an ocean, river, or other body of water, upon which a thick soft layer, such as mud, is present, comprising the steps of:

fastening one end of the body of the anchor to the lifting cable of a floating lifting device;

lifting the end of the body attached to the cable with respect to the other end;

supplying so much water to the interior of the body that the anchor assumes an upright position and the floating power of the anchor becomes negative, but not exceeding the required maximum lifting power of the lifting device;

paying out the lifting cable until the anchor reaches the bottom of the body of water and sinks therein; and

ballasting the anchor while sinking, until the required anchor weight is obtained.

4,092,945

FLOAT APPARATUS FOR BICYCLE

Walter Ankert, and Ingrid Ankert, both of R.R. #1, Box 43, Ashburn, Ontario, Canada

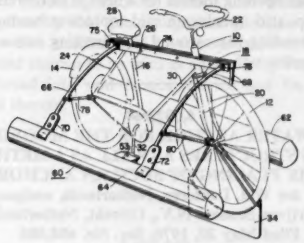
Filed Sep. 27, 1976, Ser. No. 726,472

Int. Cl.[2] B60F *3/00*

U.S. Cl. 115—2 **5 Claims**

1. A float apparatus for a conventional bicycle, said bicycle having a frame including a front fork assembly terminating in a fork and mounting means for mounting a front wheel and a handlebar coupled thereto, a rear fork assembly and rear wheel mounting bolts, a seat, and pedals, said float apparatus comprising in combination, a rudder under said front wheel of said bicycle and coupled directly to said front fork assembly whereby movement of said handlebar causes movement of said rudder, a paddle mounted directly on each pedal by means of a mounting bracket, and a left side and a right side pontoon assembly, each assembly including a pontoon, each assembly

including a frame for securing said pontoon to said bicycle at the front and rear forks thereof having spaced essentially parallel transversely extending arcuate front and rear support bars mounted to said pontoon and extending to the upper portion of said bicycle frame where said bars are coupled to each other by a horizontal support member, a front essentially horizontal



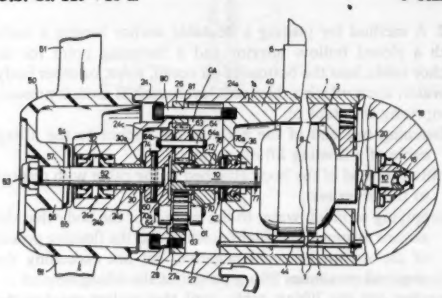
support bar extending from said arcuate transverse front support bar to said front fork of said bicycle and being pivotally mounted to said transverse front support bar and said fork, and means for coupling the left side and right side pontoon assemblies to each other along the upper portion of said bicycle frame.

4,092,946

ELECTRIC TROLLING MOTOR HAVING PLANETARY GEAR REDUCTION

Chris S. Kappas, 218-13th St., Racine, Wis. 53403

Filed Jul. 25, 1977, Ser. No. 818,310
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—18 E **8 Claims**



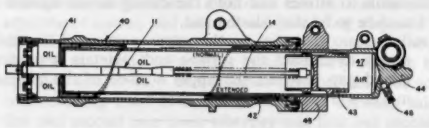
1. An electric trolling motor comprising, a cylindrical motor housing having an electric motor therein and a motor drive shaft extending rearwardly therefrom and terminating in a rear driving end, a cylindrical gear housing located rearwardly and abutting against said motor housing and having a complementary shape therewith, said gear housing having an axial bore therein and a transverse shoulder at the inner end of said bore, an internal gear ring mounted in said bore and abutting against said shoulder and means for removably but rigidly securing said gear ring in said bore and against said shoulder, said gear housing also including a rearwardly extending hub, a rear sleeve thrust bearing mounted centrally in said hub, a propeller shaft rotatably journalled in said rear sleeve thrust bearing and extending through said hub and rearwardly thereof; a bearing support located within said gear housing but axially spaced from said gear ring and extending into said motor housing, means removably securing said bearing support in said motor housing, said bearing support having a central and axially extending aperture therethrough and an anti-friction bearing assembly mounted in said aperture, a sun and planetary gear assembly mounted within said gear housing and comprising, a planet gear rear carrier and a planet gear front carrier axially spaced apart and in coaxial alignment with one another, a plurality of planet gears rotatably mounted between said carriers and in circumferentially spaced relationship therearound, means for rotatably mounting each of said planetary gears between said rear and front carriers, said gear assembly also including a centrally disposed sun gear in constant mesh with said planet gears, said planet gears also being in constant mesh with said internal gear ring, a front sleeve thrust bearing located in said front carrier and in which said motor shaft is journalled, said sun gear and said rear end of said motor shaft forming an axial releasable driving connection therebetween, said front sleeve thrust bearing abutting against said anti-friction bearing assembly, and a propeller shaft having a detachable connection with said rear carrier and extending through said rear sleeve thrust bearing.

4,092,947

OIL LEVEL INDICATOR FOR USE WITH DAMPING FLUID METERING PINS

Jean P. Labrecque, Stratford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1977, Ser. No. 840,189
Int. Cl.[2] F16F *9/06*; G01F *23/00*
U.S. Cl. 116—118 R **7 Claims**



1. A hydraulic fluid level indicator for use in combination with a hydraulic fluid metering pin positioned in an extensible shock absorbing unit comprising:

a rod slidably received in a bore extending longitudinally through a metering pin;

means preventing the passage of oil through said bore; and

means urging said rod out one end of said metering pin into view upon the occurrence of selected conditions in said unit,

the exposed portion of said rod indicating extremely extended positions of said unit resulting from unusually low hydraulic fluid levels therein which levels normally would be concealed by increased air pressure in said unit.

4,092,948

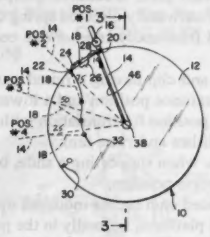
GAUGE FOR INDICATING AVAILABLE WATER SUPPLY

Thomas Bray, 1910 Bahama Dr., Miramar, Fla. 33023

Filed Jan. 5, 1977, Ser. No. 756,741
Int. Cl.[2] G01D *1/00*
U.S. Cl. 116—114 PV **8 Claims**

1. Apparatus for exponentially indicating the linear movement of a movable reference marker comprising base means for tracking the movement of a movable reference marker, a first point on said indicator means pivotally secured to a movable arm, said arm being movably secured to said base for positioning said indicator means on said base, said arm being movable to project into the path of a movable reference marker, a second point on said indicator means being slidably mounted on track means, said track means being secured to and positioned on said base at an angle to said arm so that when said

indicator means is moved by said arm, the angle of alignment of said first point and said second point on said indicator means



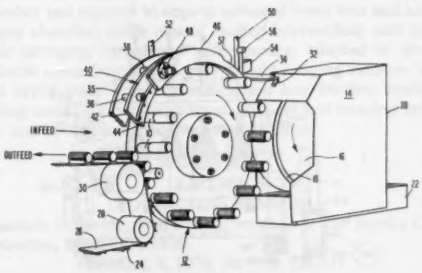
is changed with respect to said arm, said indicator means being positionable in the path of a movable reference marker.

4,092,949

CONTAINER ROLLBACK DETECTOR AND COATING APPARATUS

Romano Balordi, Millers, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Dec. 2, 1976, Ser. No. 746,941
Int. Cl.[2] B05C *1/02, 13/02*
U.S. Cl. 118—6 14 Claims



1. In a container handling apparatus for transporting metal cans along a predetermined path and having a series of moving mandrels for receiving cans and conveying them along the path, means for urging cans onto ones of said mandrels, and means for sensing the presence of a can which is not fully seated upon a mandrel, the improvement comprising:

a shoe disposed adjacent a segment of the path traversed by said mandrels for frictionally engaging said mandrels to cause said mandrels to rotate; and

a substantially rigid, elongate stripper arm disposed adjacent at least a portion of said segment and including an edge section extending generally parallel to said path, said edge section being sufficiently close to the mandrel surfaces to prevent cans having rolled-back edges from fitting between said stripper arm and said mandrel surfaces, but permitting the passageway therebetween of sidewalls of undeformed cans;

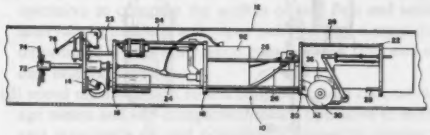
whereby cans having rolled back edges are prevented from fully seating upon said mandrels.

4,092,950

INTERNAL PIPE COATING APPARATUS

Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Jun. 20, 1977, Ser. No. 808,200
Int. Cl.[2] B05C *7/02, 7/08, 19/00*
U.S. Cl. 118—8 5 Claims



1. An internal pipe coating apparatus for coating the interior surfaces of uncoated weld joints in an otherwise internally coated pipeline comprising a frame having wheels at the forward and rear ends thereof, the forward end being oriented towards an uncoated weld joint to be coated, a drive motor for driving one pair of wheels to move the coating apparatus within the pipeline towards the uncoated weld joint, a pivotal feeler mechanism located at the forward end of said frame, said feeler mechanism including a pair of electrically conductive arms adapted to bear against the internal surface of the pipeline and to create a completed circuit when the feeler arms engage the bare surface of the uncoated weld joint to stop the drive motor, means responsive to the actuation of said drive motor for pivoting said feeler mechanism into position where said feeler arms are in contacting position against the internal surface of the pipe, a rotatable hollow shaft located at the forward end of said frame, said hollow rotatable shaft being provided with a hollow hub and a plurality of hollow radiating arms adapted to spray powder on the uncoated weld joint, a spin motor mounted on said frame for rotating said shaft, means for actuating said spin motor, a powder suspension device mounted on said frame, means for conducting a suspension of powder from said powder suspension device to said hollow hub, a fan means mounted on said frame and actuated in subsequent timed relation to the actuation of the spin motor to provide air under pressure to the powder suspension device to suspend powder therein, a valve located on said conducting means, valve operating means actuated in timed relation with and subsequent to the actuation of said fan means for opening said valve to provide a stream of powder to the hollow hub so that a suspension of powder passes out of the hollow arms by centrifugal force to coat the heated weld joint.

4,092,951

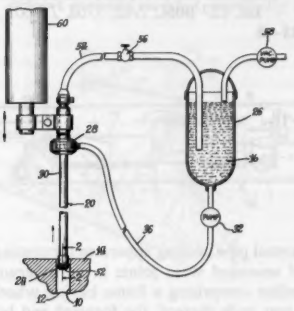
MENISCUS FORMING APPLICATOR INCLUDING VACUUM ANTI DRIP

Floyd B. Kopis, 330 Interstate Rd., Addison, Ill. 60101

Division of Ser. No. 506,355, Sep. 16, 1974, abandoned. This application May 9, 1977, Ser. No. 794,811
Int. Cl.[2] B05C *5/00, 7/06*
U.S. Cl. 118—50 5 Claims

1. For applying liquid to the interior surface of a bore within an object, an elongated applicator of generally cylindrical form defining a generally circular shoulder having an overflow periphery dimensioned diametrically to fit within the bore leaving a small but noncritical radial space between the overflow periphery and the bore, liquid supply means for supplying the liquid continuously to the applicator to flow onto the shoulder thereof and cling thereto to define a liquid bead which under the restraint of surface tension protrudes beyond the overflow periphery sufficiently to contact the bore surface when the applicator is positioned within the bore, said applicator defining an aspirating intake underlying the overflow periphery in circumferentially distributed relation to said shoulder, and suction means connected with said aspirating intake on the applicator to continuously apply suction thereto to

aspirate liquid from an annular zone immediately below the overflow periphery to prevent dripping and wastage of liquid from the applicator even when the applicator is removed from



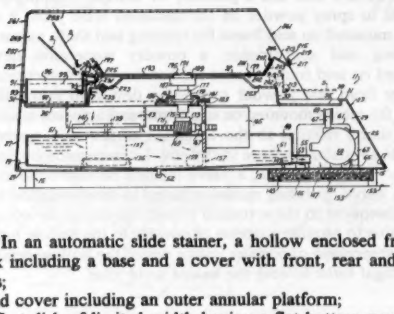
a bore and to remove a portion of the liquid deposited on a surrounding bore surface by the liquid bead on the shoulder as an incident to passage of the applicator through the bore.

4,092,952

AUTOMATIC SLIDE STAINER

Ronald N. Wilkie, and Arman Mooradian, both of 30076 Dequindre, Warren, Mich. 48092

Filed Aug. 19, 1977, Ser. No. 826,064
Int. Cl.[2] B05C *3/04, 3/09, 11/10, 13/00*
U.S. Cl. 118—58 **37 Claims**



1. In an automatic slide stainer, a hollow enclosed framework including a base and a cover with front, rear and side walls;

said cover including an outer annular platform;

a first dish of limited width having a flat bottom mounted upon said platform, adapted to contain a chemical solution;

a stain dish of increased width having a flat bottom mounted upon said platform at one side adjacent said first dish, adapted to contain a stain solution;

a reservoir tank mounted upon said base within said framework, having an outlet, and adapted to contain a rinse solution;

a rinse tank connected to and in communication with said reservoir tank, projected up through an aperture in said platform and adjacent the other side of said stain dish, and having an inlet above said reservoir tank;

a motor-operated pump mounted upon said base within said framework, and having an inlet and outlet;

conduits respectively interconnecting the reservoir outlet and pump inlet, and pump outlet and rinse tank inlet, for the continuous circulation of rinse liquid through said rinse tank;

a power rotated upright hub journalled and supported upon and within said framework centrally of said platform and projecting through and above said cover;

a drive means upon said framework connected to said hub;

a disc shaped slide retainer plate mounted upon and centrally secured to said hub for rotation radially inward of said dishes and tank;

a series of radially extending slide retainers pivotally mounted upon said plate around its periphery, each retainer having an outwardly directed spring clip adapted to supportably and frictionally receive one end of a slide to be stained;

said slide retainer and clip having a raised secured position, a raised slide clearance position and a lowered horizontal slide immersion position for translation within the fluids in the respective dishes and rinse tank;

said slide retainers, when supporting a slide, being normally biased to immersion position;

and a series of spaced cam means mounted upon said cover inwardly of said platform, normally in the path of rotative movement of said slide retainers and slides for movably camming the retainers successively to raised slide clearance position;

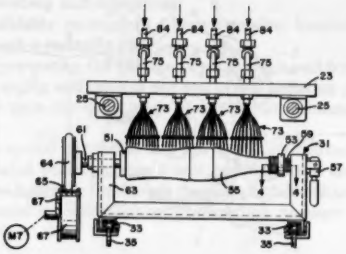
said cam means being located adjacent and in advance of the radial sides of each dish and tank so that said retainers and connected slide are temporarily cammed to raised clearance position to clear the dish and tank sides during continous rotation thereof.

4,092,953

APPARATUS FOR COATING GLASS CONTAINERS

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed Dec. 9, 1976, Ser. No. 748,946
Int. Cl.[2] B05B *13/04*
U.S. Cl. 118—642 **6 Claims**



1. Apparatus for coating a glass container with a layer of plastic comprising:

means for rotating a glass container about a horizontal axis and moving said container past a coating station,

a plurality of liquid applicator nozzle means, positioned above the coating station, each of said nozzle means, including a plurality of fluid carrying tubes distributed axially along said container, for supplying uncured plastic liquid to an associated area on the container as the container rotates,

means for supplying predetermined quantities of uncured plastic liquid to respective ones of said plurality of nozzle means, and

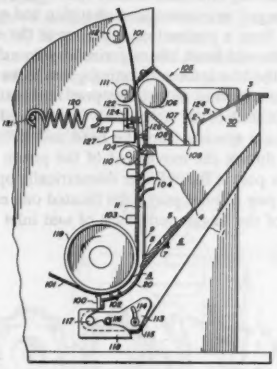
means for rotating said container about a horizontal axis after uncured liquid plastic is applied to said container at said coating station such that said container is rotated as said plastic cures,

whereby each of said nozzle means provides a coating of desired thickness on its associated container area.

4,092,954
HIGH SPEED TANK DEVELOPMENT SYSTEM

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,156
Int. Cl.[2] G03G 15/08
U.S. Cl. 118—658 8 Claims

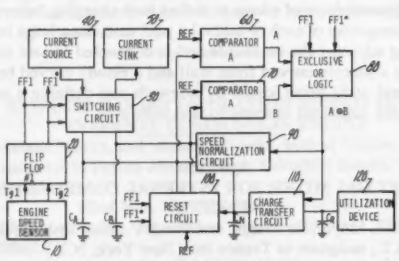


1. Apparatus for applying magnetic toner to a latent magnetic image on an imaging member moving at high speed, comprising: a housing having an upper magnetic toner supply chamber provided with an opening through which magnetic toner can flow under the influence of gravity; a bottom housing wall member below said opening and shaped to conform to a portion of the path of travel of said imaging member; a lip-seal affixed to said bottom housing wall member adapted to divert air flow away from and retain magnetic toner upon, said bottom housing wall member; means for magnetically salvaging airborne magnetic toner located above said toner supply chamber and adapted to deposit salvaged toner into said toner supply chamber; baffle means, located intermediate said magnetic salvaging means and said opening; adapted to divert airborne toner from the vicinity of said imaging member into said upper toner supply chamber; and low friction, resilient sealing means for confining toner between said imaging member, said lip-seal and said developer housing.

4,092,955
ROUGHNESS SENSOR

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 4, 1976, Ser. No. 729,317
Int. Cl.[2] F02B 3/04
U.S. Cl. 123—32 EA 12 Claims



1. Roughness sensor means for detecting and measuring the cycle-to-cycle changes in engine speed comprising:

(a) engine speed sensor means adapted to respond to an engine event recurring each engine cycle to produce therein an alternating signal comprising first and second transitions defining first and second contiguous intervals therebetween varying directly with the periods of each cycle;

(b) content storage means coupled to said engine speed sensor means operative to store contents representing the width of at least one of said first and second intervals;

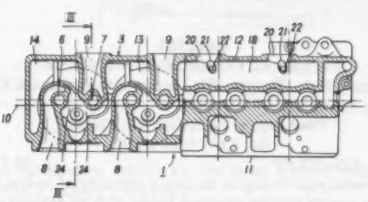
(c) comparator means coupled to said content storage means operative to compare the widths of said first and second intervals to produce an output pulse having a magnitude determined by the difference between said first and second intervals; and,

(d) speed normalization means coupled to said content storage means and said comparator means operative to modify said magnitude of said comparator output to produce a roughness signal varying directly with said comparator output and inversely with said contents.

4,092,956
WATER COOLED INTERNAL COMBUSTION ENGINE, PARTICULARLY A DIESEL ENGINE

Hans List, 126, Heinrichstrasse, Othmar Skatsche, Josef Greier, Bertram Obermayer, Gerhard Feichtinger, and Johann Wagner, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 26, 1976, Ser. No. 717,894
Claims priority, application Austria, Sep. 4, 1975, 6849/75
Int. Cl.[2] F02F 1/36
U.S. Cl. 123—41.74 5 Claims

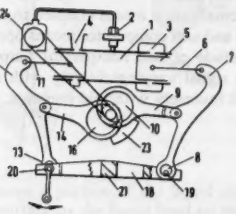


1. A water cooled internal combustion engine comprising a cylinder block, a cylinder head cast integrally with the cylinder block, an overhead camshaft housing cast integrally with the cylinder head and the cylinder block, an overhead camshaft located in said camshaft housing, intake and exhaust valves and fuel injection nozzles suspended in the cylinder head, means forming exhaust ducts which extend transversely of the engine to an exterior wall on the exhaust side of the engine, means forming a cooling water chamber extending over all cylinders of the engine, means forming a cooling water distributor channel extending in the longitudinal direction of the engine and positioned immediately above the exhaust ducts, said cooling water distributor channel communicating with the cylinder head cooling water chamber of each cylinder via means forming a bore directed towards a cylinder head wall area adjacent the intake and exhaust valves and the fuel injection nozzle of the associated cylinder.

4,092,957
COMPRESSION IGNITION INTERNAL COMBUSTION ENGINE

Donald Wilfred Tryhorn, Slough, England, assignor to Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd., Slough, England

Filed Oct. 15, 1975, Ser. No. 622,602
Claims priority, application United Kingdom, Oct. 16, 1974, 44869/74
Int. Cl.² F02B *75/04*
U.S. Cl. 123—48 B **5 Claims**



1. A compression ignition engine having a crankshaft and cylinder means and comprising for each cylinder,
two opposed pistons reciprocable in each cylinder,
two rocker beams, one for each piston having fulcrums which are stationary and at ends of the beams and lie on a line parallel to the axis of the respective cylinder,
piston rods connecting the pistons to their respective rocker beams,
oppositely positioned cranks directly adjacent to one another on the crankshaft,
one connecting rod coupling one of said rocker beams to a respective crank,
connecting rods coupling the opposite rocker beam to respective cranks so that the rods connecting said opposite beam are directly adjacent to and on either side of the rod connecting said one of said beams,
the engine further comprising means for adjusting the positions of the stationary fulcrums to vary the compression ratio of the engine, and
fuel inlet means and exhaust means.

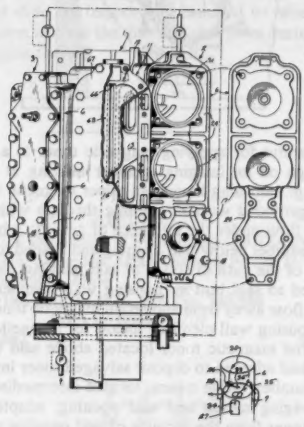
4,092,958
INTERNAL COMBUSTION ENGINE

David Jerry Hale, Pickett, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 4, 1975, Ser. No. 610,319
Int. Cl.² F02B *33/07*
U.S. Cl. 123—73 PP **26 Claims**

1. A two-cycle V-engine having a plurality of in-line cylinders in a pair of angular oriented banks with an exhaust chamber located between said banks with a common wall between the cylinders and the exhaust chamber, each of said cylinders having a head located at a defined head end portion and having circumferentially spaced inlet and outlet port means, a reciprocating piston in each of said cylinders characterized by a loop charging and scavenging apparatus wherein said port means comprise an exhaust port unit located in said common wall and extending from the cylinder through said common wall into the exhaust chamber and extending longitudinally of the banks of cylinders toward one end of said banks of cylinders, said exhaust chamber exiting from said one end of the engine, a pair of oppositely located inlet port units for supplying of inlet gases to each cylinder, each of said inlet port units having an inlet port including essentially linear sidewalls which are substantially differently angularly oriented with a progressively converging angle of flow from the back of the port to the front and a discharge opening of the port unit to direct the inlet gases across the cylinder with an angle of impact adjacent the wall of the cylinder opposite said exhaust port unit and moving outwardly to the head of the cylinder and across the top of the piston toward said exhaust port unit and then moving from the head in the opposite direction and toward the exhaust port unit in the general form of a loop to define loop charging and scavenging of the cylinder.

20. In a two-cycle engine, an open-ended cylinder formed in an engine cylinder block and closed at one end by a head and having a piston reciprocally mounted in the cylinder, said cylinder block having circumferentially spaced inlet and outlet port means arranged to create a loop charging and scavenging of the cylinder from a pressurized chamber at the end of the cylinder opposite said head, characterized by an exhaust port unit located in the block for exhausting gases from the cylinder, said port unit having an exhaust port terminating in the cylinder and located to be completely uncovered with the piston at maximum spacing from the head and to be progressively covered during the movement of the piston from said position, a finger port in the cylinder diametrically opposite the exhaust port, a pair of inlet port units located one each to the opposite sides of the finger port, each of said inlet port units



having a passageway extending through the block parallel to the cylinder and coupling the pressurized chamber to the cylinder, said inlet port units being located on diametrically opposite sides of the cylinder and essentially equicircumferentially spaced from the exhaust port and the finger port, said inlet port units each having an inlet port having essentially straight sidewalls which are substantially differently angularly oriented with a progressively converging angle of flow directing the charge from said ports toward the finger port with an angle creating impact adjacent the finger port said finger port introducing a charge merging with the flow from the inlet ports and moving from the ports to the head of the cylinder and then from the head of the cylinder to said exhaust opening in the general form of a loop to define loop charging, wherein said passageway of each of said inlet port units has a large inlet opening adjacent the crankcase and is connected to said inlet port by a sharply curved front wall and a slowly curved back wall, said walls being joined by sidewalls and defining a progressively restricted opening to said inlet port.

4,092,959
INLET GAS MIXER FOR INTERNAL COMBUSTION ENGINE

Edward A. Mayer, Newburgh, and Frank V. Sassi, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 265,107, Jun. 21, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,911
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **1 Claim**

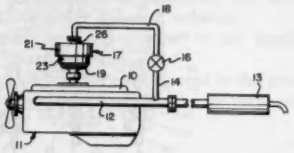
1. In combination with an internal combustion engine having

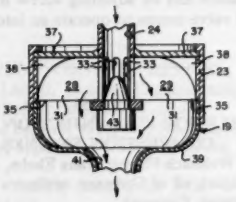
intake and exhaust manifolds, an exhaust gas recycling system incorporated in said engine to recycle a portion of exhaust gas from said exhaust manifold whereby to intermix with air to form a homogeneous preliminary gaseous mixture for introduction to said engine intake manifold,

a gas mixer (17) in said gas recycling system adapted to receive flows of said exhaust gas and air respectively, and to form said preliminary gaseous mixture, said gas mixer comprising,

an elongated casing defining a circular gas mixing compartment (19) having opposed ends,

inlet means for exhaust gas and air disposed transversely on one end of said elongated casing, an impinging wall (39) positioned at the casing opposed end against which air and exhaust gas streams impinge prior to leaving said mixing compartment (19),





means forming a discharge port (41) opening into said gas mixing compartment (19) and communicated with said engine intake manifold to conduct said preliminary gaseous mixture to the latter,

said inlet means for exhaust gas including a conduit (24) communicated with said mixing compartment (19) and with said engine exhaust manifold respectively to conduct a stream of exhaust gas from the latter and,

a plurality of nozzles (27) communicated with said conduit (24), being circularly arranged about the latter and having discharge slots (35) extending from said conduit (24) radially outward to the wall of said casing, whereby to define between adjacent nozzles, intermediate passages communicated with a source of air, said conduit (24) includes an internal deflecting surface (43) at the conduit end, and openings (33) formed in the conduit wall adjacent to said deflecting surface to communicate said nozzles (27) with said conduit.

4,092,960

EXHAUST GAS RECIRCULATION SYSTEM IN AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, and Masaaki Tanaka, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

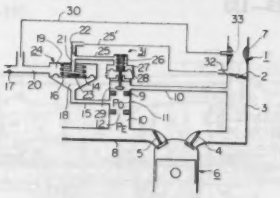
Filed Nov. 18, 1976, Ser. No. 743,145

Claims priority, application Japan, Jun. 18, 1976, 51-78896[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **2 Claims**

1. A back pressure-controlled exhaust gas recirculation system (EGR system) in an internal combustion engine comprising a pressure-operated EGR valve means with a pressure control chamber disposed in an EGR conduit connecting an exhaust pipe to an intake pipe of the engine, said EGR valve means being provided with a pressure sensing pipe extending therefrom to a pressure source, and a back pressure transducer having an atmospheric pressure chamber connected to said pressure sensing pipe and having a pressure operation chamber



connected to said pressure control chamber, wherein the improvement comprises an air bleed passage connected, at one end, to said atmospheric pressure chamber of said back pressure transducer and the other end of said air bleed passage opening into the atmospheric air, said air bleed passage being provided with a branch passage diverging therefrom and being connected to a venturi portion of a carburetor.

4,092,961

CARBURETION SYSTEM FOR PREVENTING ENGINE MISFIRES DURING GEAR CHANGES

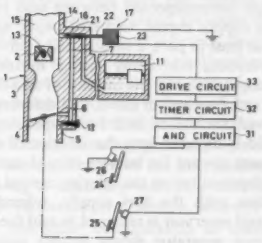
Minoru Yamada, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1977, Ser. No. 801,798

Claims priority, application Japan, Mar. 10, 1977, 52-25450

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 EC **7 Claims**



1. A carburetion system for use in an internal combustion engine of a vehicle comprising:

an intake passage for said engine;

a throttle valve located in said intake passage;

an idle port open in said intake passage;

means for providing a first signal when a clutch pedal of said vehicle is depressed;

means for providing a second signal when said throttle valve is at an idle opening position;

a coincidence detecting circuit for detecting the simultaneous occurrence of said first and second signals and providing an output signal when coincidence is detected, said output signal representing a gear changing condition;

a fuel passage for directing fuel to said idle port;

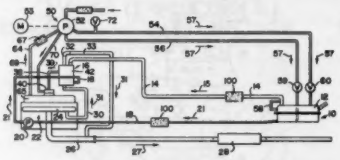
valve means for opening a communication path between the atmosphere and said fuel passage in response to said output signal, whereby air is introduced into said fuel passage at the time of changing gears; and

timing means for closing said valve means a predetermined period of time after said coincidence detecting circuit provides said output.

4,092,962
PRECARBURETOR IGNITION SYSTEM

Arthur L. Beaton, and Nelson E. Weygant, both of St. Petersburg, Fla., assignors to Steven P. Corrigan, Omaha, Nebr.

Continuation-in-part of Ser. No. 508,273, Sep. 23, 1974, abandoned. This application Apr. 1, 1976, Ser. No. 672,723
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—133 **5 Claims**



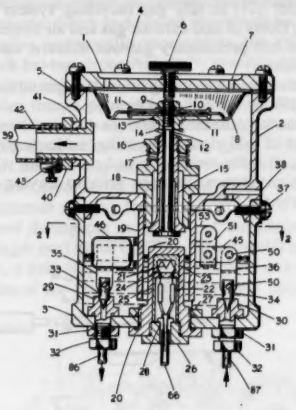
1. A precarburetor ignition system for use in combination with an internal combustion engine said system comprising: thermerator means interconnected to the intake manifold of the internal combustion engine, fuel source means, fuel supply means interconnected in fluid communication between said thermerator means and said fuel source means; said fuel supply means comprising, at least in part, supply conduit means; said thermerator means comprising heat source means disposed in direct engagement with exhaust gases from the internal combustion engine; fuel vapor separator means disposed in fluid communication between said fuel supply means and said thermerator means, spray orifice means having a predetermined configuration and connected in fluid delivery position to the interior of said fluid vapor separator means, said spray orifice means dimensioned to deliver fuel from said supply means to the interior of said fuel vapor separator means in at least a partial vapor state, said fuel vapor separator means further comprising reservoir means disposed in spaced relation to the point of connection of said spray orifice means, return conduit means interconnected between said reservoir means and said fuel supply means, said fuel vapor separator means comprising, at least in part, a substantially curvilinear longitudinal configuration, said spray orifice means connected in interconnecting relation to the interior of said fuel vapor separator means and disposed in direct fuel delivery relation to an interior curved surface of said fuel vapor separator means, whereby fluid is directed into the interior of said fuel vapor separator means toward the interior curved surface, said reservoir means disposed below the interior curved surface in fluid communication with the fuel supply, whereby excess fuel collected in said reservoir is returned to said fuel supply means; said fuel vapor separator means further comprising an air intake means disposed in fluid communication with the interior of said fuel vapor separator means, whereby air is mixed with partially vaporized fuel from said spray orifice means and delivered to said thermerator for complete vaporization upon receiving heat therefrom.

4,092,963
VAPORIZER-REGULATOR, LIQUID FUEL

Richard A. Vrooman, 22628-87th West, Edmonds, Wash. 98020

Filed Feb. 24, 1977, Ser. No. 771,638
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—133 **6 Claims**

4. In a liquid fuel vaporizer-regulator device, a lower housing fuel reservoir chamber means, an upper housing expansion chamber means with an outlet fitting means to distribute fuel vapor to an engine, a smaller diameter vapor chamber duct means connecting the upper and lower housing means, hydrostatic pressure means suppling liquid fuel from the lower housing means into the vapor chamber duct means lower end, an electrically energized heating element and housing means placed inside the vapor chamber duct means lower end and immersed in the liquid fuel, a float operated inlet and outlet valve and linkage means placed around the vapor chamber duct means and controlling fluid level hydrostatic pressure means and the electrically energized heating element means operation, high and low speed valve means mounted in a valve housing means to regulate fuel vapor flow from the vapor

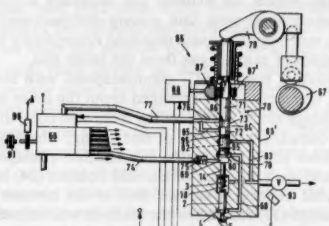


chamber duct means upper end into the upper housing expansion chamber means, a mechanical means to displace the high speed valve means and an adjusting screw means to displace the low speed valve means to operate an internal combustion engine.

4,092,964
PUMP NOZZLE FOR FUEL INJECTION IN INTERNAL COMBUSTION ENGINES

Gerald Höfer, Weissach-Flacht; Franz Eheim, and Odon Kopse, both of Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 16, 1976, Ser. No. 751,853
Claims priority, application Germany, Dec. 24, 1975, 2558699
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AT **10 Claims**



1. A fuel pump nozzle for injecting fuel into an internal combustion engine, comprising:

a housing within which a pump cylinder, a spring chamber, a pressure chamber, a working chamber, and an equalizing chamber are defined;

a transport piston;

a slave piston, said transport piston and said slave piston being coaxially disposed within the pump cylinder, and defining the equalizing chamber with the pump cylinder, said slave piston also defining the working chamber with the pump cylinder, said transport piston defining a control portion formed as part of its terminal edge facing the equalizing chamber;

mechanical means engageable with the transport piston for mechanically driving the transport piston;

means defining a supply bore connected to the housing for supplying a low pressure fluid to the equalizing chamber, said supply bore being closeable by the control portion of the transport piston terminal edge;

means defining a relief bore connected to the housing for relieving the pressure in the equalizing chamber under the control of the slave piston;

means defining a pre-load fuel quantity line connected to the housing for delivering a pre-load fuel quantity to the working chamber;

a check valve located in the pre-load fuel quantity line, opening in the direction of fuel flow; and

means defining a pressure line connecting the working chamber and the pressure chamber, wherein:

(i) fuel serves as the fluid delivered to the equalizing chamber by the supply bore; and

(ii) the pre-load fuel quantity is delivered to the pressure chamber through the pressure line by the slave piston.

4,092,965

PUMP CONTROL DEVICES

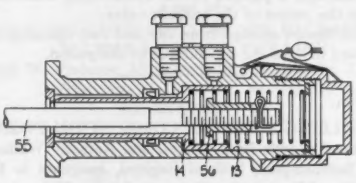
Edward Robert Lintott, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 13, 1976, Ser. No. 722,432

Claims priority, application United Kingdom, Sep. 27, 1975, 39666/75

Int. Cl.² F02D *1/04, 1/06*

U.S. Cl. 123—140 FG **12 Claims**



1. A control device for the fuel pump of an internal combustion engine, the pump being of the kind including a control member movable to influence the supply of fuel to the engine, the device including a fluid pressure operable piston arranged when fluid under pressure is applied thereto, to move said control member to a position in which no fuel is supplied to the engine and a solenoid operable valve controlled by a manually operable switch, said valve when said switch is opened, serving to allow fluid under pressure to be applied to said piston, a cylinder in which said piston is located, an inlet for fluid under pressure in said cylinder, said inlet being controlled by said solenoid operable valve, a port formed in the wall of the cylinder said port being uncovered by said piston when the latter has moved a predetermined extent under the action of fluid under pressure supplied through said inlet, and a further solenoid operable valve for controlling flow through said port, the arrangement being such that when said further solenoid operable valve is closed the piston can move its maximum extent in the cylinder under the action of fluid pressure but when said further solenoid operable valve is open the piston will move only so far as to uncover said port.

4,092,966

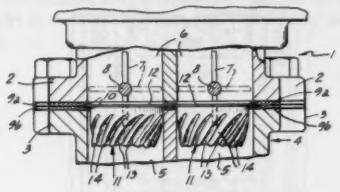
FUEL VAPORIZING AND MIXING DEVICE FOR GASOLINE ENGINES

Gildo Prosen, Chicago, Ill., assignor to Vortac, Inc., Glenview, Ill.

Filed Nov. 3, 1976, Ser. No. 738,623

Int. Cl.² F02M *29/06*

U.S. Cl. 123—141 **4 Claims**



1. A carburetor attachment for insertion between a carburetor and a cooperable engine intake manifold, comprising a sleeve-like tubular member, formed from relatively thin formable sheet material of tubular configuration, adapted to be inserted in the intake bore of such a manifold, said tubular member having at its inlet end a radially outwardly extending annular flange, of greater diameter than that of such an intake bore for supporting the same therein with such flange disposed between the cooperable mating faces of the carburetor and intake manifold, said tubular member having an external diameter at such end slightly less than that of such a bore, the side walls of said tubular member having a plurality of inwardly directed protuberances forming alternate lands and grooves in the internal surface of said tubular member, the inlet ends of the lands being rounded and merging into the sidewalls of said tubular member adjacent the inlet end thereof, the bottom edges of said grooves being arranged for close disposition to the sidewalls of such an intake bore whereby the effective area at the discharge end is only slightly smaller than that of the intake end, as compared with the total area of such an intake bore, said lands being uniformly spaced and having their respective inlet ends circumferentially offset with respect to their associated outlet ends, forming generally spirally arranged lands with the internal surface of the intermediate portion of said sleeve having a relatively smoothly curved serpentine configuration in transverse cross section, whereby each land is of a generally triangular configuration in transverse cross section, having inwardly converging sidewall portions connected by a convex rounded portion.

4,092,967

I.C. ENGINES

Robert Alan Haslett, Shoreham-by-Sea, England, assignor to Ricardo & Co., Engineers (1927) Limited, England

Filed Oct. 6, 1976, Ser. No. 730,071

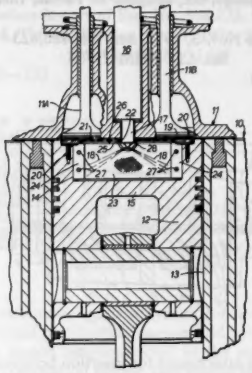
Claims priority, application United Kingdom, Jun. 10, 1976, 24156/76

Int. Cl.² F02B *75/12*

U.S. Cl. 123—143 B **14 Claims**

1. An internal combustion engine of reciprocating-piston type having a cylinder with a combustion chamber, and a piston with a crown in the cylinder, the major portion of the volume of said combustion chamber being afforded by a recess formed in the crown of the piston, the recess having a bottom, a catalytic element in the cylinder carried by the piston and mounted in a position overlying the bottom of said recess, and

means for injecting fuel into said recess, when the piston is at about its top-dead-centre position, in a direction such that



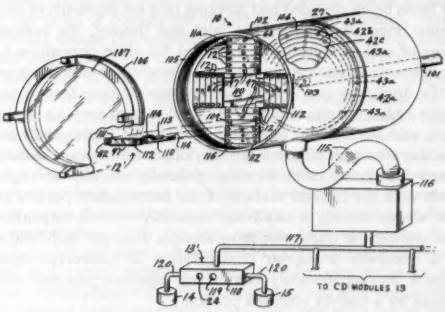
substantially the whole of the injected fuel will contact the surface of the catalytic element to initiate its combustion.

4,092,968

ENGINE IGNITION SYSTEM

Fred Douglas Stover, Mt. Vernon, and George Carl Thatcher, Centerburg, both of Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 9, 1977, Ser. No. 766,883
Int. Cl.[2] F02P *1/00, 7/02, 9/00*
U.S. Cl. 123—148 E **11 Claims**



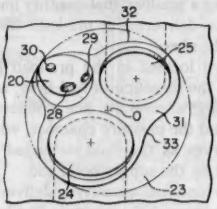
1. An ignition system for a multiple combustion chamber internal combustion engine comprising, in combination, a timing disc, means for rotating said timing disc in synchronism with the engine, first sensor means scanning a predetermined track on said timing disc as said timing disc is rotated for generating first signals in response to predetermined portions of said track, a separate second sensor means and a separate capacitive discharge circuit means associated with each combustion chamber in the engine, said second sensor means scanning predetermined tracks on said timing disc as said timing disc is rotated for selectively generating second signals in response to the sensing of predetermined portions of such scanned tracts during the occurrence of such first signal, each of said capacitive discharge circuit means including a storage capacitor, an ignition coil having a primary winding and electronic switch means for discharging said capacitor through said primary winding, means for charging said capacitor, and means responsive to a second signal from a second sensor means for triggering the electronic switch means in said capacitive discharge circuit means associated with such second sensor means.

4,092,96[illegible]

GASOLINE ENGINE FED WITH LEAN MIXTURE ONLY

Junichi Ono; Akira Shimoura, both of Toyonaka, and Yukiyasu Tanaka, Okazaki, all of Japan, assignors to Daihatsu Kogyo Kabushiki Kaisha, Ikeda, Japan

Filed Apr. 26, 1976, Ser. No. 680,085
Claims priority, application Japan, Aug. 16, 1975, 50-99720
Int. Cl.[2] F02B *3/00, 23/00*
U.S. Cl. 123—191 S **9 Claims**



1. A gasoline engine fed with lead mixture only, said engine having a cylinder, a piston therein and a cylinder head provided with a torch chamber having a spark plug therein for emitting a plurality of flames into the combustion chamber, and a suction valve and an exhaust valve, characterized in that;

(a) the cylinder head is provided with a combustion chamber recess with a periphery which enters toward the center line of the cylinder in a maximum amount between the suction valve and the exhaust valve to provide an area to create an intense turbulence of a lean mixture in cooperation with the top surface of the piston;

(b) the torch chamber is located on the cylinder head at a position spaced from the center line of the cylinder; and

(c) the torch chamber is provided with at least two openings, the center line of one of said openings being directed to pass through a portion of the combustion chamber just below the center of the head of the suction valve, and the center line of the other of said openings being directed to pass through a portion of the combustion chamber just below the center of the exhaust valve;

the torch flames emitted from the said two openings being directed toward the top surface of the piston.

4,092,970

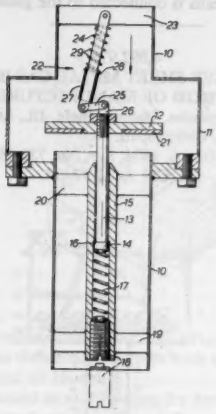
CONTROLLING INTERNAL COMBUSTION ENGINES

Gerald Stuart Morris Ball, Didcot, and Anthony Walter Andrews, Southampton, both of England, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 405,861, Oct. 12, 1973, abandoned, which is a continuation of Ser. No. 184,624, Jun. 1, 1971, abandoned. This application Nov. 3, 1975, Ser. No. 628,510
Claims priority, application United Kingdom, Jun. 5, 1970, 27316/75; May 17, 1971, 15261/71
Int. Cl.[2] F02B *77/00;* **F02D** *11/08*
U.S. Cl. 123—198 D **20 Claims**

1. A valve in combination with an internal combustion engine for automatically controlling the maximum speed of said engine, a first conduit portion forning at least part of the intake passageway of said engine and having at least a first valve seat, the maximum internal diameter of the said first conduit portion and the said first valve seat being D, movably mounted valve means having at least a first sealing surface and operable as a function of pressure differential, support means for mounting said valve means for movement between a normally open position and a closed position, said first sealing surface disposed in operable contact with said first valve seat for substantially sealing off said first conduit portion and preventing flow therethrough when said valve means is in its closed position, spring means biasing said valve means into said open position away from said first valve seat, adjusting means for adjusting the amount of bias supplied by said spring means to said valve

means and being substantially inaccessible when operatively assembled with said engine, said first sealing surface and said first valve seat being spaced apart by a distance L when said valve means is biased to its normally open position, wherein L is at least equal to 0.25D, said spring means and said valve means being so constructed and arranged and the bias of said spring means being so adjusted that when the rate of flow past said valve means is at least equal to a predetermined maximum



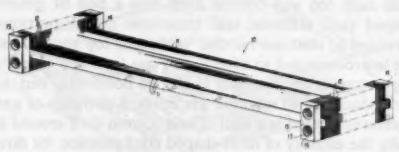
desired flow rate corresponding to a maximum desired engine speed said valve means automatically moves under influence of the resulting pressure drop thereacross into said closed position in sealed contact with said first valve seat in opposition to the bias applied by said spring means for stopping said engine, said spring means returning said valve means to said normally open position when the engine is stationary and the pressure drop across said valve means is substantially zero.

4,092,971

SELF-CONTAINED, MULTI-BLADE PACKAGE FOR SLURRY SAWS AND THE LIKE

Kenneth W. Viscount, 321 Cherry St., Carlisle, Pa. 17013

Filed Oct. 29, 1976, Ser. No. 737,128
Int. Cl.[2] B28D *1/06*
U.S. Cl. 125—16 R **5 Claims**



1. A self-contained, multi-blade package for use in the blade head assembly of a slurry saw or the like, comprising:

a plurality of elongated, thin blades in spaced, parallel array,

first and second pluralities of thin, flat spacers inserted at either end between said blades and having aligned holes therein,

at least a first connecting rod extending through aligned holes in said first plurality of spacers,

at least a second connecting rod extending through aligned holes in said second plurality of spacers,

two pairs of relatively thick end caps, at least one end cap of each pair having at least one through drilled hole and being counter bored on one face with one end of a connecting rod extending through the through drilled hole into the counter bore, said relatively thick end caps each having a thickness which approximates one-half the width dimension of the end cap, and

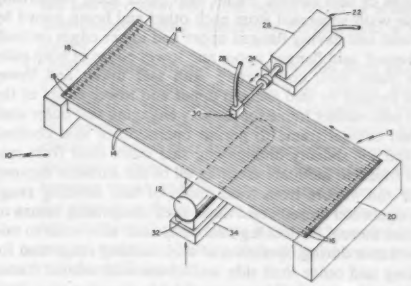
at least first and second nuts threaded, respectively, onto the ends of said first and second connecting rods extending into the counter bores of the end caps and being fully received within the recesses formed by said counter bores, said relatively thick end caps preventing distortion of the blade package when said nuts are tightened on said connecting rods thereby ensuring the rigidity and parallelism of the package and serving the function of clamping blocks in the blade head assembly of a slurry saw or the like.

4,092,972

PROCESS OF CUTTING WAFERS

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems, Inc., Salem, Mass.

Filed Feb. 11, 1977, Ser. No. 767,809
Int. Cl.[2] B28D *1/08*
U.S. Cl. 125—16 R **23 Claims**



1. In the process of cutting a workpiece with abrasive particles in which longitudinally-extending blades are moved relative to the workpiece, that improvement comprising:

providing a blade including a longitudinally-extending abrasive-holding portion of metallic material having a hardness less than that of said abrasive particles overlying a blade core of greater tensile strength, said abrasive-holding portion defining a cutting surface extending between the opposite sides of said blade and defining less than one half the total outer surface of said blade

placing said blade under tension adjacent a charging element with said cutting surface of said abrasive-holding portion facing towards and closely adjacent said charging element;

charging said blade by embedding abrasive particles partially into said abrasive-holding portion by moving said blade under tension relative to said element while forcing said cutting surface of said blade and element towards each other and introducing abrasive particles into the interface between said abrasive-holding portion of said blade and said element,

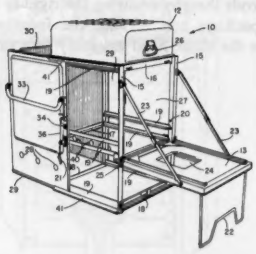
the thickness of said abrasive-holding portion being not less than about one-half the nominal size of said particles, and said particles being embedded into a longitudinally-extending segment of said cutting surface of said abrasive-holding portion but not into said sides of said blade.

4,092,973

FIELD RANGE CABINET

Richard J. Bernazzani, Roslindale, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,503
Int. Cl.[2] F24C *15/10*; A47B *77/01*; A47F *3/04*
U.S. Cl. 126—37 B 1 Claim



1. In a cooking range for use in the field which comprises a cabinet frame, a hinged front door, a hinged lid, and cabinet outer shell side and rear walls, the improvements which comprise a unitary, U-shaped, outer shell, said outer shell being removable from said cabinet frame, said cabinet frame having flanged upper and lower edges on both sides thereof forming upper and lower runners along the upper and lower edges of both sides of said cabinet frame, said outer shell comprising two side walls separated from each other and being joined by a rear wall and having flanged upper and lower edges on both sides thereof, said flanged upper and lower edges of both sides of said outer shell cooperating with said upper and lower runners formed by said flanged upper and lower edges of the sides of said cabinet frame for slidably engaging said outer shell with said cabinet frame to permit operation of said cooking range and for slidably disengaging said outer shell from said cabinet frame to facilitate cleaning all of the surfaces exposed to food and vapors from food inside of said cooking range during operation thereof, said outer shell comprising means on both sides thereof for locking said outer shell side walls to said cabinet frame during operation of said cooking range and for unlocking said outer shell side walls from said cabinet frame, whereby said outer shell becomes slidably disengageable from said cabinet frame.

4,092,974

POCKET CAMP STOVE

Iwamoto Zenzaburo, Yokohama, Japan, assignor to International Business Development Company, Bellevue, Wash.

Filed Jul. 12, 1976, Ser. No. 704,119
Int. Cl.[2] F24C *5/20*
U.S. Cl. 126—38 5 Claims

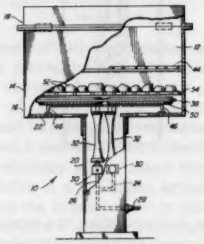
1. A portable gas stove comprising:
a gas burner unit including a burner head; and
a gas supply conduit having an outlet end connected to said burner unit, and an inlet end connected to gas control means which are adapted for connection to a can of gaseous fuel under pressure of a type having a protruding depressable member controlled outlet valve built into the can, and in which gas flows out from said can via an axial passageway in said depressable member, said gas control means being operable for moving the depressable member selectively variable amounts for both turning the gas flow on and off and regulating its flow rate, and said gas control means including an inlet port which is in alignment with the axial passageway in the depressable member when said gas control means is connected to the gaseous fuel can.

4,092,975

PLURAL CHAMBER SHEET METAL GAS BURNER AND METHOD OF MANUFACTURE

Nick G. Grammatopoulos, Bloomingdale, Ill., assignor to Groman Corporation, Chicago, Ill.

Filed Oct. 6, 1976, Ser. No. 730,133
Int. Cl.[2] A47J *37/07*
U.S. Cl. 126—41 R 3 Claims



1. A gas burner for use in a gas fired cooking grill of the type adapted to carry a horizontally disposed rack for supporting food and having gas supply inlets, the improvement comprising, in combination, a pair of generally H-shaped stamped sheet metal shells generally U-shaped in cross-section, one comprising a top shell and the other comprising a bottom shell, said top and bottom shells being secured together by a peripheral lip on one of said shells being bent over a peripheral edge on the other of said shells so as to form a permanent seal around substantially the entire periphery of said H-shaped shells and thereby form a gas chamber therein, said top and bottom shells each being formed with a depressed planar portion which extends transversely across the width of the shell approximately midway between the ends thereof so as to divide each top and bottom shell into a pair of generally U-shaped shell sections, said transverse planar portions being arranged to abut one another when said top and bottom shells are interconnected so as to form a gas-tight seal thereby defining two separate generally U-shaped hollow burner chambers for connection to separate gas inlets, a plurality of gas outlet apertures formed in a wall of said bottom shell around substantially the entirety of its H-shaped configuration for directing a gas flame upwardly over said peripheral lip on said top shell, and a pair of gas inlet apertures formed in said bottom shell on opposite sides of said transverse planar portions for connection to respective gas inlets.

4,092,976

AIR CONDITIONER

Carrol E. Buckner, Asheville, N.C., assignor to Buck Stove Marketing, Corp., Asheville, N.C.

Filed Jun. 7, 1976, Ser. No. 693,805
Int. Cl.[2] F24C *1/14*
U.S. Cl. 126—63 19 Claims

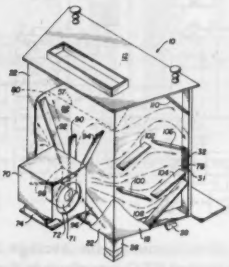
1. An air conditioning unit comprising:
a housing having a top, a bottom, a front, a back, and two side walls;
a back and two side interior walls adjacent to said back and

two side walls of said housing for forming a substantially U-shaped forced air channel;

an opening in said front wall for providing access to a chamber defined by the interior of said interior walls;

vent means in a front wall of said side air channels adjacent the side edges of said opening;

a rim mounted to said front wall of each of said side air channels and extending across said vent means from the outer lateral edge thereof;



the side exterior walls of said forced air channel forming an angle less than ninety degrees with the front wall of said side forced air channels;

means mounted to said housing for forcibly introducing air into the back portion of said channel through a port to traverse said air channel and to exit said vent means creating an exiting forced air pattern adjacent said side edges of said opening; and

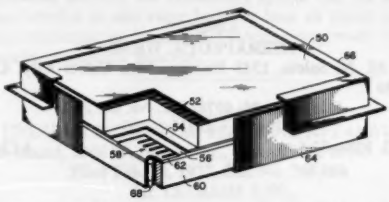
directing means interior said air channel for directing said forced air from said port over a substantial portion of said back and two side interior walls to said vent means.

4,092,977

FLAT PLATE SOLAR COLLECTOR

Richard Warren Gurtler, Mesa; Robert Maxwell Handy, Phoenix; Michael Chancey Keeling, Tempe, and Israel Arnold Lesk, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 12, 1976, Ser. No. 704,145
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



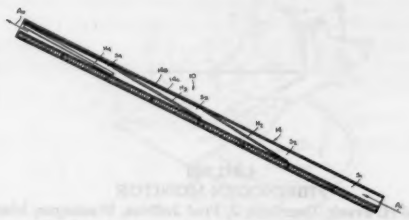
1. An efficient solar collector, comprising: a thin base; insulating means placed on top of the thin base; a fluid flow plate having a plurality of passages for conducting a fluid to be heated by the solar collector, the fluid flow plate being on top of the insulating means; an absorber having a layer of black chrome deposited over a layer of a metal foil, the absorber being bonded to the top of the fluid flow plate; a convection suppressor placed on top of the absorber for reducing heat losses from the absorber; a transparent cover for allowing solar radiation to pass placed on top of the convection suppressor; means to form a frame around the outer periphery of the thin base, insulating means, fluid flow plate, absorber, convection suppressor, and transparent cover all in a stacked relationship, the means to form a frame being easily removable from the stacked elements thereby providing a solar collector that is lightweight, efficient, and easily assembled and disassembled.

4,092,978

SOLAR ENERGY COLLECTOR

Richard S. Levine, R.R. No. 5, Kidville La., Lexington, Ky. 40511

Filed Aug. 11, 1976, Ser. No. 713,624
Int. Cl.² F24J *3/02*; F28F *13/00*
U.S. Cl. 126—270 **14 Claims**



1. A solar energy collector comprising:

A. an elongated open channel exposed to solar energy;

B. a transparent cover assembly disposed over said channel to admit said solar energy and to define an elongated passage having an input end into which cold air is admitted and an output end from which warm air is discharged, said channel being effectively divided into a series of stages;

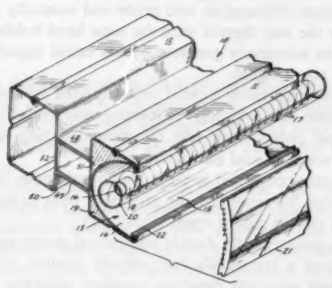
C. heat exchange means disposed within each stage of the channel to absorb heat from solar energy transmitted through the cover assembly and to transfer the heat to the air passing through the channel, said means having an effective surface area which increases progressively in the successive stages so that as the temperature difference between the air and the heat exchange means is reduced as the air passes through the successive stages, the surface area of the exchange means increases to maintain a rapid rate of transfer whereby each stage operates at close to optimum efficiency.

4,092,979

COMBINED SOLAR ENERGY CONVERSION AND STRUCTURAL AND MECHANICAL BEAM AND STRUCTURES BUILT THEREFROM

Joseph C. Kotlarz, 109 W. Woodlawn Dr., Mundelein, Ill. 60060

Filed Nov. 4, 1976, Ser. No. 738,845
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**



1. A combined solar collector and structural and mechanical beam, said beam comprising; spaced, longitudinally extending, adjacent channel-shaped portions, at least one of said channel-

shaped portions having an open side, said beam also including a longitudinally extending recessed portion between the channel-shaped portions;

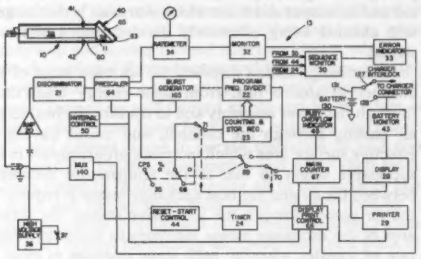
a solar collector assembly disposed within the channel-shaped portion having the open side, said solar collector assembly comprising a highly polished reflector arranged within the channel-shaped portion; an absorber tube disposed within the reflector and spaced therefrom to absorb the sun's energy; and

a transparent cover positioned over the open end of said channel portion.

4,092,980
FIBRINOGEN MONITOR

Donald H. Frank, Deerfield; J. Fred Jeffries, Waukegan; Mary C. Swanson, Lincolnwood, all of Ill.; Thomas L. Erb, and James D. Hall, both of Austin, Tex., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,254
Int. Cl.[2] A61B *6/00*
U.S. Cl. 128—2 A **27 Claims**



1. A portable instrument for use in detecting the formation of blood clots in a patient in whom a quantity of fibrinogen tracer-labelled with a radioisotope has been administered, said portable instrument comprising:

an axially elongated hand-held radiation monitoring probe having a radiation detecting member at one end thereof disposed at an angle to the longitudinal probe axis to thereby enable use of said probe in areas of small clearance on the patient's body such as the anterior and posterior sides of the patient's legs;

switch means disposed on said probe and manually actuatable by the user thereof with the same hand holding said probe to selectively generate a start count signal and a record count signal;

pulse processing means located remotely from said monitoring probe for counting, processing and recording the electrical pulses from said radiation detecting member upon receipt of said start count signal;

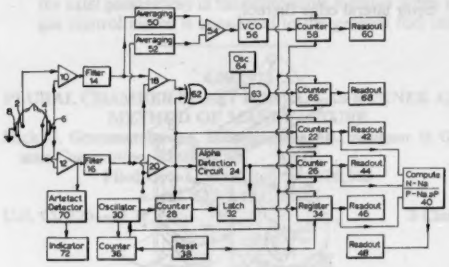
record means connected to the output of said pulse processing means for recording the processed pulse count upon receipt of said record count signal; and

means to automatically disable said record means upon the receipt of a statistically insignificant number of pulses from said radiation detecting member, whereby a safeguard is provided against the measurement and recordation of statistically insignificant data due to an extremely low level of fibrinogen concentration or because of mispositioning of the radiation monitoring tube.

4,092,981
METHOD AND APPARATUS FOR BRAIN WAVEFORM EXAMINATION

John Paul Ertl, 42 Halford Ave., Toronto, Ontario, Canada

Filed Jul. 15, 1976, Ser. No. 705,400
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.1 B **13 Claims**

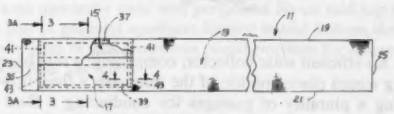


1. A method of determining the average frequency of a sample of a band-limited EEG waveform in the presence of an intermittent interfering unwanted alpha rhythm waveform of relatively greater amplitude than the components of the wanted waveform and of a defined frequency range within said band limits, comprising sensing a subject's brain waveform, limiting said waveform to frequencies within said band limits, detecting in a sample of said waveform at least every alternate zero crossing point in the waveform, counting the events defined by adjacent alternate crossing points, identifying events having durations respectively within and outside a range corresponding to the duration of a cycle of a waveform within the defined frequency range of the unwanted waveform, determining the number and the sum of the durations of the events having durations outside said range during said sample, and calculating from said number and said sum the average frequency of these latter events.

4,092,982
THERAPEUTIC WRAP

Nazih M. N. Salem, 1312 Raintree Cir., Culver City, Calif. 90230

Filed Apr. 16, 1976, Ser. No. 677,832
Int. Cl.[2] A61N *15/00*
U.S. Cl. 128—82.1 **4 Claims**



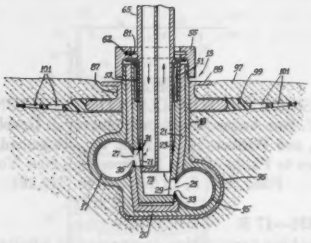
1. A therapeutic wrap consisting of an inner strip and an outer strip attached to each other along one end, the outer strip being an elongated resilient elastic compression bandage material, the inner strip being of flexible material formed into at least one pocket for receiving prepackaged coolants of manufacture, and running nominally coincidental with the outer strip, wherein at least one loop of flexible material is attached to the backside of the inner strip at intervals along its length; said at least one loop freely encircling the outer strip.

4,092,983

BLOOD ACCESS DEVICE

Victor Slivenko, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jan. 31, 1977, Ser. No. 764,207
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **16 Claims**



1. A device to provide access to the circulatory system of a living body for simultaneous withdrawal from and return of blood to the system comprising a pair of parallel tubular conduits of generally circular cross section, either one being insertable in a living blood vessel and the other being connectable to a by-pass graft of that same blood vessel; a generally cylindrical housing having one end closed and extending transversely of and adjoining said conduits near the closed end, the points of adjoining both conduits being spaced apart from each other longitudinally with respect to the axis of the housing and being spaced away from the axis, said housing having fluid communication with each of said conduits through an aperture in the conduit walls at each of said points of adjoining, the perimeter defining each of said apertures being formed of a sharp edge of the conduit wall, said housing having a length sufficient to extend from the blood vessel to a point outside the living body; a valve body in said housing, said valve body having therein a pair of spaced apart ports that are located to be alignable with the apertures at one given rotative position of said valve body, said valve body being adapted to receive a dual-conduit catheter in fluid communication with said ports, one conduit to one port, and said valve body being coaxially rotatable in said housing between positions of alignment and nonalignment of said apertures and said ports to selectively establish fluid communication between the circulatory system and the catheter when inserted in said valve body; at least all blood and skin tissue contacting surfaces of said device being made of a biologically compatible material.

4,092,984

UNDULATING RECTAL FLUSHING APPARATUS

Paul Bindel, 3946 W. North Ave., Chicago, Ill. 60647

Filed Feb. 14, 1977, Ser. No. 768,086
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—229 **2 Claims**

1. A portable apparatus for irrigation of the colon and intestines removably positioned on the rim of a toliet bowl and held in position by the usual toilet seat comprising:

(a) a base plate,

(1) having a semicircular cutout portion, and

(2) a pair of spaced slots therein positioned opposite the cutout;

(b) an enclosed housing anchored on the upper side and on one end of said plate;

(c) a motor in said housing operatively connected to:

(1) a reduction gearing,

(2) a shaft extending from said reduction gearing;

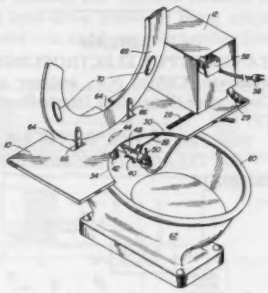
(d) a circular cam fixedly mounted to said shaft,

(1) said cam having a plurality of lobes, each lobe having a curved rising work face and a falling work face;

(e) an elongated rod shaft extending through said plate to medially of said cutout portion;

(f) an elongated cam follower having one end positionable on said cam, and its other end fixedly mounted to one end of said rod shaft;

(g) an adjustable crank arm secured to the other end of said rod shaft, having a right angled arm at its free end and supporting one end of a curved wide arm extending at right angles thereto;



(h) a vertically extending guideway secured to and depending from said plate;

(i) a slide bar supported in said guideway,

(1) a cross arm secured at one end to said slide bar and extending at right angles to said guideway and having a portion thereof lying on said curved arm,

(2) a support bracket anchored to the free end of said rod;

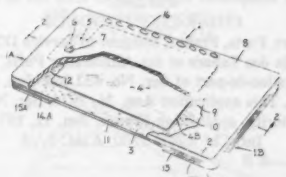
(j) an enema tip removably mounted in said bracket and directed to jet warm fluid vertically for vertically reciprocative motion relative to said base plate.

4,092,985

BODY ELECTRODE FOR ELECTRO-MEDICAL USE

John George Kaufman, 858 Condor Drive, Burlington, Ontario, Canada

Continuation-in-part of Ser. No. 526,681, Nov. 25, 1974, Pat. No. 3,972,329. This application Aug. 2, 1976, Ser. No. 710,535
Int. Cl.[2] A61N *3/06*
U.S. Cl. 128—303.13 **8 Claims**



1. A body electrode useful as the return electrode in electrosurgical procedures, comprising: an elastically, resiliently stretchable cover sheet member having an inner surface for facing towards the body and an outer surface for facing away therefrom;

a flexible, electrically conductive metal sheet member connected to said cover sheet member having an outer surface presented towards the inner surface of said cover sheet member, and an inner surface for facing towards the body;

terminal means in electrically conductive relation to said metal sheet member;

means for attaching the body electrode to a patient's body;

a layer of water permeable woven fibrous webbing covering in its entirety the inner surface of said metal sheet member and extending beyond the peripheral edge thereof, and

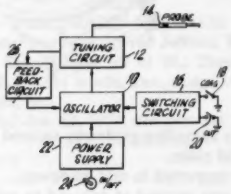
adapted to receive and restrain the flow of electrically conductive medium of thin semi-solid or fluid consistency applied thereto, said layer having a thickness of from about 1/50 to about ¼ inch, the fibres of said webbing being of low water absorbency and being interwoven together into said webbing in interlocking fashion, said layer being secured to the cover sheet member at locations beyond the peripheral edge of said metal sheet member, and said layer being elastically resiliently stretchable along with the cover sheet member.

4,092,986

CONSTANT OUTPUT ELECTROSURGICAL UNIT

Max Schneiderman, Clifton, N.J., assignor to Ipco Hospital Supply Corporation (Whaledent International Division), New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,525
Int. Cl.² A61B 17/36; A61N 3/00
U.S. Cl. 128—303.14 **17 Claims**



1. An electrosurgical unit providing an output voltage to a load, comprising an oscillator producing an output signal of a given frequency, a control circuit means coupled to the oscillator for providing an output voltage from the oscillator for use in surgical procedures, a feedback circuit means coupled from the output to the input of the oscillator to maintain the output voltage level from the unit as a substantially constant value independent of the load, and wherein said oscillator includes a control electrode, and said control circuit means includes a switching transistor having its collector-emitter circuit connected between said control electrode and ground, and having a fixed voltage on its base, capacitor means, and means for selectively connecting said means to said base.

4,092,987

CIGAR-LIKE PRODUCT

Pierre Imbert, Paris, France, assignor to Service D'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Continuation-in-part of Ser. No. 432,060, Jan. 9, 1974, abandoned. This application Aug. 26, 1976, Ser. No. 717,569
Claims priority, application France, Jan. 12, 1973, 73.00987
Int. Cl.² A24D 1/00; A24C 5/18
U.S. Cl. 131—8 R **2 Claims**

1. A smokable cigar-like product comprising a plurality of prepared fragments of natural or manufactured tobacco leaves having irregularly contoured main surfaces whose dimensions of length and breadth are substantially greater than the thickness of the leaves, said fragments being compressed axially at constant cross-section into a rod-like shape with an orientation in said rod such that the major proportion of those fragments lying in a line parallel to the main axis of the product are encountered by said line at an angle of incidence relative to said main surface greater than zero with at least 30 percent of those fragments constituting said major proportion being encountered at a substantially perpendicular angle of incidence so as to be intersected by said line substantially through the direction of their initial thickness, and a smokable outer wrapping around said rod operable to coherently maintain the fragments in said orientation.

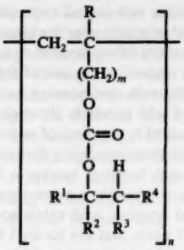
4,092,988

SMOKING TOBACCO COMPOSITIONS

Thomas V. Van Auken, Richmond; Harvey J. Grubbs, Mechanicsville, and William R. Johnson, Jr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,291
Int. Cl.² A24B 3/12
U.S. Cl. 131—17 R **8 Claims**

1. A smoking composition comprising an admixture of natural or reconstituted tobacco and between about 0.0005 and 10 weight percent, based on the weight of tobacco, of a polymeric carbonate ester composition having a molecular weight in the range between about 500 and 2,000,000 and consisting essentially of recurring monomer units corresponding to the formula:



wherein R is a member selected from the group consisting of hydrogen and aliphatic, alicyclic and aromatic hydrocarbon radicals containing between 1 and about 10 carbon atoms, with the proviso that R is hydrogen when m is zero; R^1, R^2, R^3 and R^4 are members independently selected from the group consisting of hydrogen and aliphatic, alicyclic and aromatic hydrocarbon radicals, and R^1 and R^3 when taken together with connecting elements form an alicyclic structure, and wherein the total number of carbon atoms in R^1, R^2, R^3 and R^4 collectively does not exceed about 20; *m* is an integer between 0 and about 8; and *n* is an integer between 2 and about 10,000.

4,092,989

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

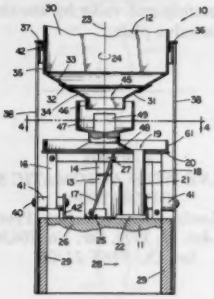
Division of Ser. No. 482,776, Jun. 24, 1974, Pat. No. 3,920,027, which is a division of Ser. No. 219,136, Jan. 19, 1972, Pat. No. 3,840,023. This application Jun. 12, 1975, Ser. No. 586,368
Claims priority, application Switzerland, Jan. 19, 1971, 773/71; Jun. 23, 1971, 9156/71; Jan. 11, 1972, 380/72
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² A24B 15/04
U.S. Cl. 131—17 R **2 Claims**

2. A tobacco or tobacco product having added thereto about 1 to about 1000 parts per million based on the weight of tobacco of epoxy-β-ionone.

4,092,990
VIBRATORY COIN FEEDER

Robert T. Bayne, Carmel, Ind., assignor to Standard Changemakers, Inc., Indianapolis, Ind.

Filed Sep. 15, 1975, Ser. No. 613,074
Int. Cl.[2] G07D *1/00*
U.S. Cl. 133—1 R **3 Claims**



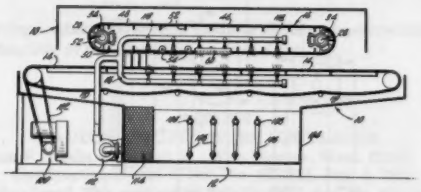
1. A vibratory coin feeder comprising:
a frame;
a hopper mounted to said frame to receive jumbled coins;
a platform positioned beneath said hopper to receive coins therefrom, said platform having an outer circumferentially extending wall with a coin outlet located inwardly next to said wall;
drive means operable to vibrate said hopper and platform moving said coins from said hopper onto said platform and outwardly to said outlet;
dispensing means adapted to receive coins from said outlet and being operable to dispense coins thereform in a controlled predetermined amount;
said hopper includes a lower portion with a hopper coin outlet and an upper portion connected together both of which support said jumbled coins; and further comprising:
isolation means connecting said lower portion to said upper portion but vibration isolating said upper portion from said lower portion;
supporting means mounted to said frame and supporting said upper portion of said hopper, said supporting means being vibration isolated from said frame;
spring means mounting said platform and said lower portion of said hopper on said frame and allowing said platform and said lower portion of said hopper to vertically move in response to said drive means;
both said upper portion and said lower portion of said hopper have downwardly slanting parallel walls to support said jumbled coins with said upper portion of said hopper supported by said supporting means reducing the load of coins supported by said spring means.

4,092,991
CLEANING MACHINE

Marvin K. Rohrs, Fanwood, N.J., assignor to Metalwash Machinery Corporation, Elizabeth, N.J.

Division of Ser. No. 623,210, Oct. 16, 1975, abandoned, which is a continuation of Ser. No. 481,072, Jun. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 458,635, Apr. 8, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 687,078
Int. Cl.[2] B08B *9/08*
U.S. Cl. 134—127 **4 Claims**

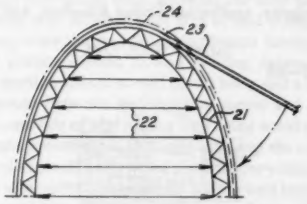
1. A machine for washing beverage cans comprising a transport conveyor including a reticulate belt member upon an upper course of which cans to be washed are carried and a hold-down conveyor including a reticulate belt member having a lower course space above the upper course of said transport conveyor, spray means disposed to direct liquid through said belt members and onto said cans, said belt member of said hold-down conveyor being trained around conveyor drums, a surface of the hold-down belt member contacting said drums having a plurality of longitudinally spaced and transversely extending stiffener members projecting therefrom and said conveyor drums having recesses on belt member contacting surfaces thereof, said recesses being circumferentially spaced around said surface whereby said stiffener members, during the passage of the hold-down conveyor belt around said drums, extend into said recesses and opposite surfaces of said belt member of said hold-down conveyor being adapted for engagement with said cans and being substantially free of projections, said stiffener members each consisting only of a single flat strip disposed substantially normal to adjacent portions of said belt member of said hold-down conveyor and each being secured thereto at an edge region of said strip to leave the regions of the belt member between the planes of said strips substantially free of restriction to the passage of said sprays therethrough, said belt member being provided with a plurality of roller means projecting laterally from the edges thereof, said roller means cooperating with track means disposed adjacent longitudinal edges of the lower course of said hold-down conveyor to guide said lower course and prevent sagging of said longitudinal edge regions of said belt member.



4,092,992
LAMINATED ARCH MEMBERS AND METHOD OF CONSTRUCTING THEM

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich. and Jon D. Vredevoogd, Lansing, Mich.

Filed Feb. 23, 1976, Ser. No. 660,450
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—3 R **30 Claims**



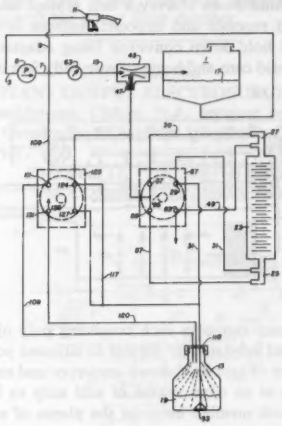
1. A substantially, hollow structural encompass or beam member having at least one predetermined curved bight, comprising multiple layers of comparitively twice longitufinal structural components aligned in an assembled layer upon layer to encompas at least one continuous longitudinal tubular cavity having a cross sectional area of at least wice the cross sectional area of the wall material encompassing said tubular cavity, and means for fixing said layers together to attain a high stiffness to weight ratio in said structural member.

4,092,993

METHOD AND APPARATUS FOR PREPARING CHEMICAL SOLUTIONS

James Santon Stevenson, Oakland, Calif., assignor to Terminator Products, Inc., Oakland, Calif.

Filed Jun. 19, 1975, Ser. No. 588,417
Int. Cl.[2] B05B 9/00; F16K 11/18
U.S. Cl. 137—15 18 Claims



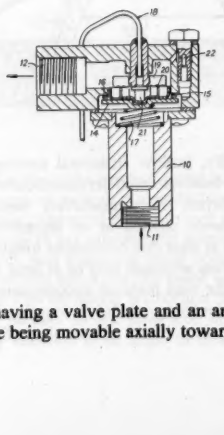
1. A system for producing a solution of a base liquid and a chemical without exposing one to risks of handling hazardous chemicals, comprising a tank for holding a predetermined quantity of base liquid, a pump having a suction end and a discharge end, a circulating system including said tank and said pump for circulating the base liquid of said tank, a Venturi in said circulating system between said pump and said tank, means including said Venturi for withdrawing from a source container of chemical a desired quantity of chemical to be mixed with such base liquid, means also including said Venturi for gradually introducing said desired quantity of chemical into said closed system while said base liquid is circulating therein, and means for selectively switching said Venturi from said chemical withdrawing means to said chemical introducing means and vice versa.

4,092,994

VALVES

Eric McGowan, St. Austell, England, assignor to United Gas Industries Limited, London, England

Filed Mar. 19, 1976, Ser. No. 668,725
Claims priority, application United Kingdom, Apr. 14, 1975, 15151/75
Int. Cl.[2] F16K 1/46
U.S. Cl. 137—65 3 Claims



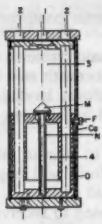
1. A valve having a valve plate and an annular valve seat, said valve plate being movable axially toward and away from said seat, an annular sealing member lying freely between said plate and seat, guide means comprising a disc with a single ring of spaced fingers extending normally therefrom around the periphery thereof, said disc abutting the valve plate and said spaced fingers extending loosely within the annular sealing member to prevent lateral movement thereof such as would take it out of alignment with the seat but allowing the sealing member freedom to move axially with respect to the fingers and means for operating said valve by abutting the disc and thereby moving the valve plate.

4,092,995

MULTIPLE VALVE WITH AUTOMATIC SEQUENTIAL OPERATION

Paul Stubenruss, Kostlanerweg, 4, Brixen, Prov. Bozen, Italy

Filed Jul. 19, 1976, Ser. No. 706,863
Int. Cl.[2] F16K 21/06
U.S. Cl. 137—119 11 Claims



1. A valve for controlling the flow of fluid under pressure from an inlet to a plurality of outlets in sequence, said valve comprising:

a tubular casing having an internal opening about an axis and having two axial ends;

actuator means within said opening and dividing said opening into two chambers;

means bearing on the actuator means and urging it to a first position adjacent one of said ends whereby one of said chambers, the one at said one end, is normally small and the other chamber is normally large;

bleed valve means communicating with said other chamber to permit fluid to be slowly discharged from said other chamber;

means communicating with said inlet and said one chamber to permit said pressurized fluid to flow into said one chamber whereby the pressurized fluid acts on said actuator means and moves it against the urging of said second mentioned means from said first position and toward the other of said ends to a second position;

cycle control valve means connected to the actuator means to open said two chambers into communication with each other when said actuator means arrives at said second position and to close said communication between said two chambers when said actuator means returns to said first position, whereby when said two chambers are in communication said second mentioned means will return said actuator means to said first position;

rotatable sequencing valve means and connected to said inlet and said outlets for placing said outlets sequentially in communication with said inlet depending on the position of the valve means; and

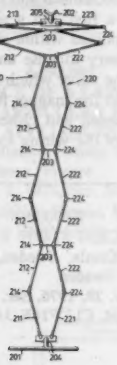
indexing means for rotating the sequencing valve means as said actuator means moves from said second to said first position.

4,092,996

WATER DISPENSING APPARATUS

Arne Karl Kock, Swedenborgsgatan 5B, Stockholm, Sweden

Filed Mar. 18, 1976, Ser. No. 668,243
Claims priority, application Sweden, Mar. 21, 1975, 7503242
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—344 4 Claims



1. An apparatus for conducting water from a water source to a water-consumer which is movable over a surface in relation to the water source and which comprises:

a. two substantially identical, extendible and collapsible pipe-systems each of which has a plurality of substantially rigid pipes and a plurality of pipe-coupling devices, said pipe-coupling devices being arranged to pivotally connect the ends of the pipes together so that water may flow from pipe to pipe through the pipe-coupling devices;

b. a plurality of holding means each arranged to hold a specific portion of a pipe in one pipe-system in a pivotally spaced apart relationship to a corresponding portion of a pipe in the other pipe-system, said distance being small in relation to the lengths of the pipes;

c. first water-supply means adapted to supply water from the water source to a pipe at one end of a respective pipe-system;

d. second water-supply means effective to pass water from a pipe at the other end of respective pipe-systems to the water-consumer;

e. a plurality of supporting means each arranged for carrying the pipe-systems above the surface at a holding means and comprising structures for engaging the surface; and

f. each of said holding means is arranged at each alternate pipe-coupling device of respective pipe-systems, said holding means being adapted to hold a pipe-coupling device of one pipe-system spaced at a distance from a corresponding pipe-coupling device of the other pipe-system, said distance being of the same magnitude as the cross-sectional dimensions of the pipes.

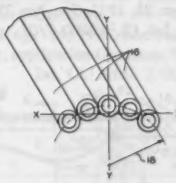
4,092,997

CONSTRAINT MEANS FOR FLEXIBLE ELEMENTS

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 26, 1977, Ser. No. 762,540
Int. Cl.[2] F16L *33/00*
U.S. Cl. 137—351 11 Claims

1. An assembly of at least three flexible elongated hydraulic conduits flexibly bonded together lengthwise thereof in such a manner that in a cross-section of said conduits an arc having a determinate curvature may be connected between the axes of said conduits, said conduits in themselves having such mechanical properties that bending the conduit assembly lengthwise and intermediate the ends thereof effects in the bend of the assembly a substantial flattening of said arc, the radius of said bend being substantially uniform and being a function of the radius of said arc, said conduits being mutually supportive and



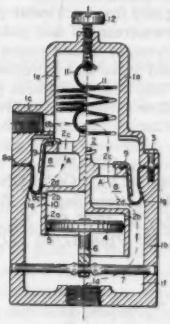
having a substantial section modulus about a transverse axis as a function of the configuration of said arc.

4,092,998

AUTOMATIC PRESSURE REGULATOR

John F. Taplin, 15 Sewall St., West Newton, Mass. 02165

Continuation-in-part of Ser. No. 692,811, Jun. 4, 1976, abandoned. This application Jul. 12, 1977, Ser. No. 815,042
Int. Cl.[2] G05D *16/06*
U.S. Cl. 137—471 14 Claims



1. An automatic pressure regulator including in combination

(a) housing means defining an inlet passageway and an outlet passageway and an inlet area adjacent said inlet passageway and an outlet area adjacent said outlet passageway;

(b) a piston body arranged and movable inside said housing means, said piston body defining an additional passageway through said piston body allowing the flow of fluid from said inlet area to said outlet area of said housing means;

(c) a deep convolution rolling diaphragm having a radially outer portion affixed to said housing means, a radially inner portion affixed to said piston body and a rolling wall interposed between said housing means and said piston body, one side of said rolling wall being acted upon by the pressure prevailing in said inlet area and the other side of said rolling wall being acted upon by the pressure prevailing in said outlet area, and said rolling wall being arranged to control the effective cross-sectional area of said additional passageway so as to control the flow of fluid from said inlet area through said piston body to said outlet area;

(d) spring means interposed between said housing means and said piston body biasing said piston body to move in a direction tending to cause said rolling wall of said rolling diaphragm to reduce said effective cross-sectional area of said additional passageway; and

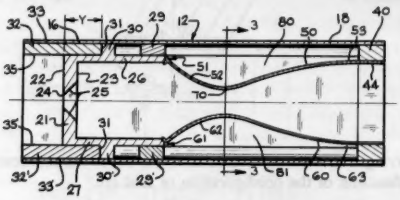
(e) means for increasing the effective area of said rolling wall of said rolling diaphragm as said piston body moves against the action of said spring means.

4,092,999

FLUID CONTROL VALVE

Lawrence M. Rubrich, Camden, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Apr. 25, 1977, Ser. No. 790,714
Int. Cl.[2] G05D 7/01
U.S. Cl. 137—504 **12 Claims**



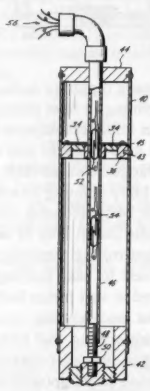
1. A fluid flow control valve comprising:
a housing having a fluid passageway extending axially therethrough from an upstream location to a downstream location;
an axially slidable piston received within said housing, said piston having a first surface for exposure to upstream fluid and a second surface for exposure to downstream fluid;
a first buckleable plate affixed to said piston and extending downstream therefrom; and
means for affixing said first buckleable plate to said housing at a location downstream of said piston,
whereby axial movement of said piston is affected by fluid flow through said valve and therefore affects the degree of buckling of said first buckleable plate which in turn stabilizes fluid flow through said valve.

4,093,000

RISING STEM VALVE POSITION INDICATOR

James S. Poff, 17310 Heritage Bay Dr., Webster, Tex. 77095

Filed May 20, 1977, Ser. No. 798,812
Int. Cl.[2] F16K 37/00, 31/528
U.S. Cl. 137—554 **4 Claims**



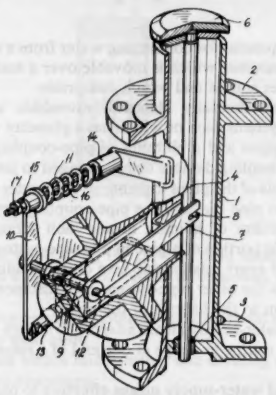
1. A position indicator adapted for use with a valve having a body, a ball core positioned within a flow passage of the valve body and movable between an opened and a closed position by rotation through an angle of 90°, a stem positioned within a stem passage of the valve body to engage the ball core, said stem having a groove provided in the surface thereof to coact with a pin extending from the body to cause a camming action which rotates the core between opened and closed positions as the stem is raised, lowered and rotated, and a handwheel mechanism to raise and lower the stem by rotating a handwheel through a series of turns about the stem, including a sleeve adapted for attachment to said handwheel mechanism for rotation thereby through the series of turns with the handwheel, a tubular shell of non-magnetic material adapted for attachment to the stem and being disposed within said sleeve and adapted to be raised, lowered and rotated by the stem, at least one magnet supported within said sleeve at a distance from the handwheel mechanism and rotatable with said sleeve about said shell, and a first and a second reed switch with associated wiring supported within said shell separated by at least a distance necessary to raise and lower the stem when opening and closing the valve which in turn raises and lowers the switches relative to the magnet for activating the respective switch at the opened and closed valve positions while limiting any twisting of the wiring to the angle of rotation of the stem.

4,093,001

EXCESS FLOW VALVE

Billy F. E. Sandin, Kumla, Sweden, assignor to AB Kalle-Regulatorer, Saffle, Sweden

Filed Mar. 29, 1976, Ser. No. 671,552
Int. Cl.[2] F16K 31/12
U.S. Cl. 137—495 **2 Claims**



1. An excess flow valve, comprising:
(a) an elongate valve housing having a flow passage extending therethrough, an upstream portion of said housing defining a valve seat;
(b) a valve stem disposed in said housing and extending through said flow passage for reciprocal movement therein, said valve stem being provided with a substantially flat valve disc at its upstream end for cooperating with said valve seat to open and close said flow passage;
(c) a lever pivotally mounted to said valve stem and extending outwardly therefrom for reciprocally driving said valve stem, said pivot being of the lost motion type;
(d) a two-arm lever pivotally mounted with respect to said housing, said two-arm lever being rigidly affixed to said first mentioned lever and disposed perpendicularly thereto;
(e) a spring carried by said valve housing and engaging one end of said two-arm lever to bias said two-arm lever in a first direction to open said flow passage, and means carried by said valve housing for adjusting the tension of said spring;
(f) selectively actuable means for applying a motive force connected to the other end of said two-arm lever to move said two arm lever in a second direction to close said flow passage; and
(g) wherein said adjusting means is adapted for adjusting the distance of said valve disc to said valve seat in a quiescent

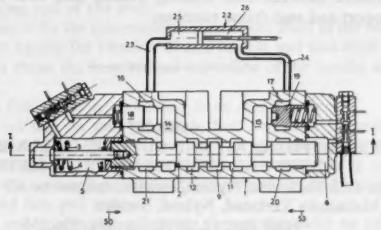
state by adjusting the tension of said spring, wherein said spring serves to bias said valve disc to an open position unless and until there is a drop in pressure on the downstream side of said disc and whereas said motive force applying means is utilized for closure of the flow passage irrespective of the pressure created by a medium flowing through the flow passage.

4,093,002

CONTROL DEVICE OF A LARGE HYDRAULIC DISTRIBUTOR, IN PARTICULAR FOR PUBLIC WORKS APPLIANCES

Maurice Tardy, Saint Etienne, France, assignor to Bennes Marrel, Andrezieux Boutheon, France

Filed Jun. 1, 1976, Ser. No. 691,649
Claims priority, application France, May 29, 1975, 75 17503
Int. Cl.[2] F15B *11/08, 13/042*
U.S. Cl. 137—596.2 **6 Claims**



1. A directional control valve comprising:

a. housing having an inlet and an outlet;

a pressure responsive spool means disposed in said housing, said spool means being movable between a first position for communicating said inlet to said outlet and a second position terminating communications between said inlet and said outlet said spool means having a pressure chamber which when communicated to pressure is operative to shift said spool means to said second position;

a reservoir port;

a pressure responsive valve means disposed in said outlet dividing said outlet into first and second pressure chambers, said valve means being normally biased to prevent fluid communication between said pressure chambers when said spool means is in said second position, said valve means further adapted to open in response to a predetermined pressure in said first pressure chamber when said spool means is in said first position and said valve means is adapted to open in response to a predetermined pressure in said second pressure chamber when said spool means is in said first position;

a third pressure chamber disposed within said housing adjacent said pressure responsive valve means;

pilot valve means operable upon activation for communicating a control pressure to said spool means to move said spool means to said second position, said pilot valve means further adapted to communicate said second pressure chamber to said third pressure chamber when said spool means is in said second position; and

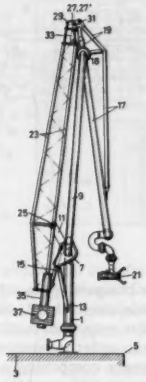
said pilot valve means closing communcation between said second and third pressure chambers when said spool means is in said second position and said pilot valve means connecting said third pressure chamber to said reservoir port, said pilot valve means having a pressure port which when communicated to pressure is operable to actuate said pilot valve means, said spool means chamber and said pressure port being connected in series by said pilot valve means.

4,093,003

APPARATUS FOR LOADING AND UNLOADING SHIPS

Hermann Miller, Krefeld, and Heinz Keltjens, Grevenbroich, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 29, 1976, Ser. No. 681,864
Claims priority, application Germany, May 15, 1975, 2522004
Int. Cl.[2] F16L *3/00*
U.S. Cl. 137—615 **4 Claims**



1. In apparatus for loading and unloading ships, a stand pipe on a dock, an inner jib pipe, bearing means at one end of the inner jib pipe connecting and pivotally mounting the inner jib pipe upon said stand pipe for movement in a vertical plane, an outer jib pipe, bearing means connecting and pivotally mounting one end of said outer jib pipe upon the other end of said inner jib pipe for pivotal movement in the same plane, an extension on said outer jib pipe extending rearward of said latter pivotal connection, a beam extending approximately parallel to the inner jib pipe, the beam adjacent one end pivotally connected through a link to said stand pipe at a bearing coaxial with the pivot bearing means of said inner jib pipe, and counter-weights on said beam for providing weight compensation for the mobile parts of the pivot bearing means on the stand pipe, hydraulic cylinders respectively connected for independent adjustment of the jib pipes; the improvement for position both said inner and outer jib pipes in a generally vertical rest position behind the dock edge comprising linkage means between said beam and the rearward extension of said outer jib pipe at its ends pivotally connected thereto respectively, and movable power means on said beam connected to said linkage means whereby the length of the beam between the pivot bearings (25) and the link (11) and the pivot bearings (31) with the extension 19 of the outer jib pipe (17) may be extended, for retracting said outer jib pipe to said rest position.

4,093,004

ARMORED CONDUIT

Stephen A. Kile, and Rufus V. Jones, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

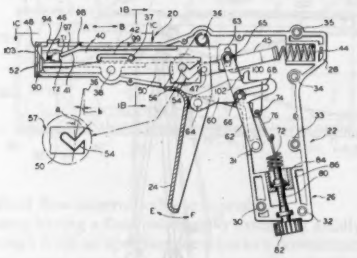
Filed Jul. 23, 1970, Ser. No. 57,808
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—140 **4 Claims**

1. An article of manufacture comprising a conduit structure comprised of a plurality of layers of oriented polyolefin material wherein said polyolefin material is positioned such that the orientation direction of adjacent layers are at angles one to the other and wherein said plurality of layers of oriented polyolefin material has established on the outer periphery thereof a covering material for the protection of said polyolefin.

4,093,005
CABLE TIE GUN

Robert M. Eberhardt, Park Ridge; James Arthur McNana, Burbank, and Dennis M. Heuer, Chicago, all of Ill., assignors to All States Plastic Manufacturing Co. Inc., Chicago, Ill.

Filed Feb. 28, 1977, Ser. No. 772,569
Int. Cl.[2] B21F 9/02
U.S. Cl. 140—123.6 17 Claims



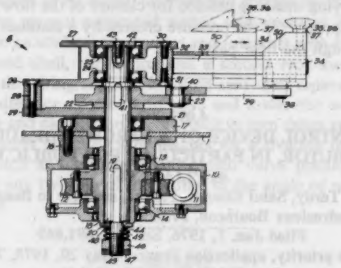
1. A cable tie gun comprising an actuator, mounted for an excursion over a predetermined arc, cable tie tensioning slide bar means mounted for reciprocal motion responsive to operation of said actuator in order to tension a strap of a cable tie, force transmitting means comprising a pair of members connected in series between said actuator and said tension slide bar, said pair of members being interconnected by a stud on one member held in a cove on another member under a preselected spring tension, means responsive to a movement of said actuator means through a limited excursion which is less than said predetermined arc for causing an interference between said tensioning slide bar and said pair of members, said interference preventing a full actuator excursion through the full swing of said predetermined arc and further preventing said stud from leaving said cove, means responsive to a tension in the strap of a cable tie for holding and immobilizing said slide bar means with a force which is greater than said predetermined spring tension, whereby said stud may slip out of said cove if said interference does not occur before the end of the limited excursion permitted by the interference, and thereby enable the actuator to take its full excursion, and means responsive to said full excursion of said actuator and effecting the range extending beyond said limited excursion where said interference normally occurs for severing the strap of a cable tie whereby said strap severing means operates only at the end of said full excursion and independently of the point in said excursion where the force of the strap tension exceeds the predetermined spring tension to immobilize the tensioning means.

4,093,006
DEVICES FOR GRIPPING WHEELS

Eleutheer A. Hessels, Europark Noord 39, 2700 Sint Niklaas, Belgium

Filed Apr. 4, 1977, Ser. No. 784,510
Claims priority, application Belgium, Apr. 7, 1976, 840441; Mar. 21, 1977, 255755
Int. Cl.[2] B25H 5/00
U.S. Cl. 144—288 A 4 Claims

1. An apparatus for gripping a wheel to permit removal of a tire fitted onto the wheel, comprising: a vertical drive shaft (20), means (7, 8) for rotating said drive shaft, a first horizontal support (26, 27, 29) rotatably mounted around said drive shaft, at least three radial guide arms (33) circumferentially spaced at equal angles around said drive shaft (20) and each having one end fixedly secured to said first horizontal support, at least three slidable members (34) each slidably mounted on a respective one of said guide arms and each having at least one claw member (50) adapted to grip on the rim of a wheel, a second horizontal support fixed on said drive shaft, at least three link members (39) each pivoted at one end (40) on said second horizontal support (23) and each pivoted at the other end (38) on a respective one of said slidable members (33), braking means arranged between said first horizontal support and a

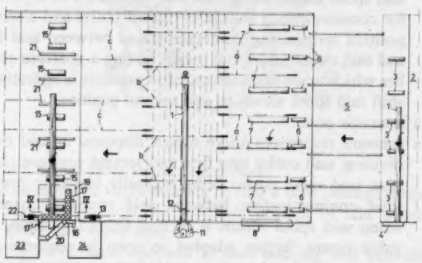


fixedly mounted frame member, and means for adjusting the pressure between said braking means, said first horizontal support and said frame member.

4,093,007
METHOD FOR ROOT END CUTTING OF LUMBER AND A DEVICE FOR PERFORMING SAID METHOD

Nils Erik Hellström, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Jun. 12, 1975, Ser. No. 586,256
Claims priority, application Sweden, Jul. 10, 1974, 74090671
Int. Cl.[2] B27C 9/00; B27B 31/00
U.S. Cl. 144—326 R 3 Claims



1. A root end cutting device for cutting ends of pieces of lumber, each piece having a longitudinal or transverse mark, said device having spaced first and second ends and comprising:

conveying means for transversely conveying the pieces of lumber through the device;

a stop;

first means for moving said pieces of lumber against said stop;

first cutter means for making a first end cut on each piece of lumber as the same is being conveyed through said device;

second cutter means longitudinally spaced from said first cutter means;

sensing means for sensing said marks;

means responsive to sensing a transverse mark for longitudinally moving said pieces to align said transverse mark with said second root cutting means for making a second cut substantially at said transverse mark; and

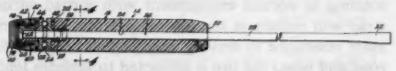
means for stopping said longitudinal movement with said mark and said second cutter in alignment.

4,093,008

SCREW DRIVER HAVING CAPPED HANDLE WITH ROTABLE CAP

Lino Martin, 2659 W. Okeechobe Rd., Hialeah, Fla. 33010

Continuation of Ser. No. 625,364, Oct. 24, 1975, abandoned.
This application Mar. 21, 1977, Ser. No. 779,594
Int. Cl.[2] B25G *1/00*
U.S. Cl. 145—61 EA 2 Claims



1. A tool comprising:

A. an elongate cylindrical handle with an axial through bore and having a first end zone and a second end zone, said handle being sized to fit the hand of a user,

B. a shaft having a first end zone, a second end zone and an intermediate zone, said intermediate zone being between the end zones, and said second end zone comprising a working end of the tool,

C. means to fix the intermediate zone of the shaft in the bore of the handle for rotation of said handle and said shaft as a unit about the longitudinal centerline of the handle and shaft,

D. said first end zone extending from said handle,

E. an end cap on said extending first end zone including means to captivate said end cap on said extending end zone in a fixed axial position in which it is rotatable on said first end zone and means rotatably journalling said end cap on said first end zone,

F. said end cap having a bearing therewithin with an axial face facing said handle and said handle having a bearing therewithin with an axial face facing said end cap and ball bearing means captivated between said bearing faces;

G. said means to captivate said end cap on said extending shaft portion comprising a headed end on the first end zone of said shaft, said headed end being of a larger diameter than the remainder of the shaft and defining an axially facing abutment shoulder when viewed from the working end of the tool and a flat bearing surface when viewed from the end cap end of the tool, said end cap bearing having an axial bore for accommodating said first end zone of said shaft and being shaped with two end portions of larger diameter than the middle portion, one large diameter portion defining said axial face facing said handle, the other opposite large diameter portion having a cylindrical recess surrounding said headed end of said shaft, the bottom of the recess defining a shoulder for bearing against said abutment shoulder of said headed end of said shaft, an end plate between said end cap and said headed end of said shaft and bearing against said flat bearing surface of said headed end, and pin means fixing said end plate to the said other opposite large diameter portion of said end cap bearing, the end cap filling in the area between the two larger diameter end portions of the end cap bearing and being held to said bearing by said pin means.

4,093,009

VACUUM PACKING DEVICE

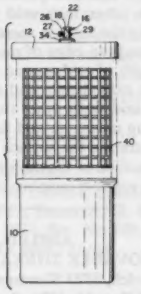
Anthony Iavarone, and Richard Anthony Iavarone, both of 20-61 St. Raymond Ave., Bronx, N.Y. 10462

Filed Mar. 4, 1977, Ser. No. 774,465
Int. Cl.[2] B65D *81/20*
U.S. Cl. 150—.5 5 Claims

1. A vacuum packing device comprising a resiliently flexible container, a resilient cover, said cover having a valve aperture therein, said cover being releaseably engageable with the top of said container,

valve means connectable to said cover through said valve aperture and selectively openable and closable when said cover is engaged to said container permitting the withdrawal of air from said container and to therefor prevent air from entering said container

support means insertable in said container before engagement of said cover to prevent the collapse of said container when air is withdrawn therefrom, said valve means including cover grasping means for grasping opposed lateral surfaces of said cover and providing a pair of pluralities of ribbed-like protrusions extending outwardly from each of said opposed lateral surfaces for manually releaseably securing said valve means to said cover.



4,093,010

CAMERA CASE

Benjamin L. Hunley, and James C. Packard, both of Clinton, Tenn., assignors to Hunley and Packard, Clinton, Tenn.

Filed May 4, 1977, Ser. No. 793,719
Int. Cl.[2] A45C *11/38*
U.S. Cl. 150—52 J 5 Claims

1. A case for fragile articles comprising a rigid container including a generally rectangular bottom member, upstanding walls including a pair of end walls including upper edges and a pair of side walls including upper edges attached to the periphery of said bottom member, said bottom member and said walls defining an open topped main compartment, a lid proportioned to unite with the upper edges of said walls to close the main compartment, resilient cushioning means having a smooth continuous surface on the interior of said compartment covering and attached to the lid, the bottom member, said end walls and said side walls, first elongated partition means for dividing said main compartment into smaller first compartments, said first partition means having a rigid, generally planar, elongated support member, said support member extending between opposed side walls of said container and extending generally perpendicular to the bottom member, cushioning means having a smooth continuous surface on the planar sides and top edge of said first partition support member, the length of said first partition rigid support member being such that it extends into and compresses the cushioning means on said opposed side walls without penetrating the

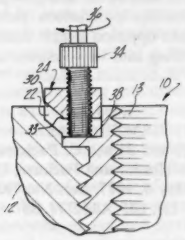
surface of said cushioning means so that the deformation of the cushioning means at least in part holds the first support member in position, and second elongated partition means for dividing one of said first compartments into smaller second compartments, said second partition means having a rigid, generally planar, elongated support member, said support member extending between said first partition means and one of said upstanding walls other than said opposed walls, generally perpendicularly to the bottom member, cushioning means on the planar sides and top edge of said second partition support member, the length of said second partition support member being such that it extends into and compresses the cushioning means on one of said walls other than said opposed side walls and the cushioning means on said first partition support member without penetrating the surface of said cushioning means, so that the deformation of the cushioning means at least in part holds the second support member in position.

4,093,011

REMOVABLE THREADED INSERT

James L. Bucknavich, 8503 Sherman, Warren, Mich. 48089

Filed Dec. 10, 1976, Ser. No. 749,461
Int. Cl.[2] F16B *39/02*
U.S. Cl. 151—57 **6 Claims**



1. In combination a threaded insert secured to an anchoring structure, each having portions thereof contiguous to each other and a locking element for locking said insert to said anchoring structure, comprising:

an axially extending pocket open at one side and having an axially inner end defining a reaction surface, said pocket formed in said insert along said portion thereof contiguous to said anchoring structure;

said locking element configured to be disposed in said pocket and seated against said reaction surface formed in said pocket and having a portion thereof extending out of said pocket and having a configuration adapted to be forced into said anchoring structure material to secure said locking element to said anchoring structure and prevent relative shearing movement between said contiguous portions of said insert and said anchoring structure; and

means for engaging said locking element and said reaction surface and forcing said locking element out of said pocket whereby said insert may be released from said anchoring structure.

4,093,012

SKID PREVENTIVE TIRE ASSEMBLY

John H. Detwiler, Manhasset, N.Y., assignor to Detwiler Corporation, Westbury, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,492
Int. Cl.[2] B60C *27/10*
U.S. Cl. 152—226 **20 Claims**

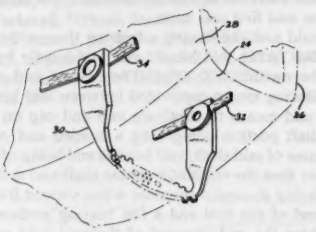
19. Anti-skid strap adapted to be removably mounted on a tire having a pair of opposed side walls and a peripheral road contacting outer circumferential surface comprising:

the strap having a greater width than thickness and having a length sufficient to permit the central portion of the strap to extend transverse to the circumferential surface of the tire across the entire surface and the end portions of the strap to extend beyond in adjacent relationship to at least a portion of the opposed side walls of the tire;

attachment means on the strap for cooperation with anchor means to removably attach the strap to the tire;

the central portion of the strap adapted to be normally positioned on the circumference of the tire with the dimensional width sides being substantially parallel with the circumferential surface of the tire so that when the tire is rotating in normal engagement with a road surface the strap will remain in the normal position and offer minimum resistance to driving engagement between tire and road and when the tire is subjected to surfaces tending to cause slippage, engagement between the strap and the road will cause the strap to automatically deform so that at least a portion of the dimensional width of the underside of the strap is brought into a position that is approximately perpendicular to the circumferential surface of the tire thereby increasing frictional and mechanical engagement with the road surface and assisting in stopping the slippage and returning the tire to normal engagement with the road surface at which time the strap will automatically return to its normal configuration and position;

at least the road contacting portion of the strap having a configuration permitting its shifting to the approximate



perpendicular position and the automatic return to the normal configuration and position;

the strap being designed to operate to provide anti-skid action on soft surfaces, on semi-hard surfaces and on hard surfaces and the strap shifting between the normal and approximate perpendicular position a predetermined amount depending upon the hardness of the road surface with which it is in engagement to provide the necessary anti-skid action;

at least one stud extending through the central portion of the strap and projecting upward from the side of the strap distal from the tire surface to provide additional road engaging contact when the strap is in the normal position and the stud being of a predetermined height above the surface of the strap so that it does not interfere with the shifting of the strap to the approximate perpendicular position; and

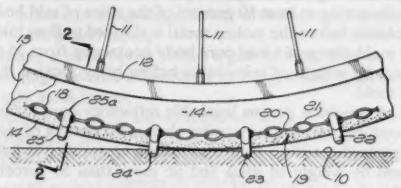
each stud being positioned on the strap and dimension so that on soft surfaces the stud and strap improve traction and prevent skidding, on semi-hard surfaces the stud assists in initiating the shifting of the strap to the approximately perpendicular position without interfering with the shifting movement, and on hard surfaces on occasion when the strap does not rotate fully to the approximate perpendicular position the stud will dig in to provide anti-skid action.

4,093,013

BIKE TRACTION ATTACHMENT

Nathanial H. Lewis, Box No. 20424, Pasadena, Calif. 90006

Filed May 23, 1975, Ser. No. 580,320
Int. Cl.[2] B60C *27/20*
U.S. Cl. 152—240 2 Claims



1. An improved traction attachment of the type having a plurality of cleats around the circumference of a tire, said cleats at some interval are held in place by a pair of side bands, a said cleat having a U-shape transverse cross-section and conforming to said tire, and having a longitudinal cross-section, that of a closed geometrical figure, wherein the improvement comprises:

(a) the said cleat is a single unit throughout; and

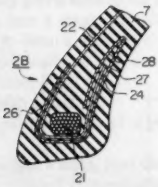
(b) U-shaped ends of said cleat, having said geometrical figure longitudinally cross-section throughout, said ends fastened around said side bands, each tip of each said end extends downward, a portion of each said tip is in contact with a horizontal plane through the lower curved portion of said cleat, thereby, each said tip prevents lateral skidding.

4,093,014

RADIAL PLY PNEUMATIC TIRE HAVING WOVEN MULTIFILAMENT FABRIC REINFORCING PLY

Hajime Tomoda, Atsugi; Kenhachi Mitsuhashi, and Tuneo Morikawa, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed May 20, 1976, Ser. No. 688,425
Claims priority, application Japan, May 27, 1975, 50-62529
Int. Cl.[2] B60C *15/06*
U.S. Cl. 152—362 CS 27 Claims



1. A radial ply pneumatic tire having a bead portion having an inside portion and an outside portion thereof comprising, embedded in a rubber matrix,

(a) a bead wire bundle;

(b) a carcass ply of a metal tire cord fabric located in the inside surface layer of the bead portion and having an end portion thereof being turned around said bead wire bundle and extending to the outside surface layer of the bead portion,

(c) one or more reinforcing plies arranged between a portion of said carcass ply extending to the outside surface layer of the bead portion and the outer surface of the outside surface layer of the bead portion, and

(d) an additional reinforcing ply having an outside end portion thereof located between the portion of said carcass ply extending to the outside surface layer of the bead portion and said reinforcing ply and the other portion thereof being turned around the turned portion of the carcass ply and extending to the inside surface layer of the bead portion along the carcass ply,

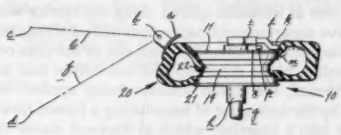
characterized in that one of said reinforcing plies, which is located closest to the outer surface of the outside surface layer of the bead portion, comprises a woven multifilament fabric consisting of multifilament warps in a density of 20 to 65 yarns/50mm and multifilament wefts in a density of 20 to 65 yarns/50mm, and has an endmost point thereof located farther from the bead wire bundle than the endmost point of the outside end portion of said carcass ply.

4,093,015

METHOD OF MOUNTING LARGE PNEUMATIC TIRES

S. W. Maliaski, P.O. Box 161, Tamaroa, Ill. 62888

Filed Jun. 23, 1977, Ser. No. 809,278
Int. Cl.[2] B60C *25/06*
U.S. Cl. 157—1.1 2 Claims



1. In the use of that type of tire mounting machine which mounts a tire casing on a horizontally secured rim having upper and lower flanges, annular bead seating areas inwardly adjacent to said flanges, and a sloping-walled drop center portion therebetween, the machine being of the type in which two counter-rotating bead deflectors, rotated from within the rim about such upper flange, commence adjacent to each other and rotate through nearly semi-circular arcs of travel in opposite senses,

the method, utilized when the tire lower bead is at least partially in the drop center portion, of mounting the tire upper bead over the rim upper flange, comprising the steps of

(a) positioning said bead deflectors adjacent to each other at a selected point along the circumference of the rim;

(b) applying, radially outward of said point against a localized area of the tread of the tire adjacent to its upper sidewall, a thrust force having a radial horizontal component and a downward component, whereby to thrust a portion of the upper bead, inward of such localized tread area, downward below the upper flange of the rim and at least partly adjacent to the lower bead part therein into its drop center;

(c) commencing the counter-rotation of said bead deflectors to deflect the upper bead from above to below the upper rim flange in an arc widening progressively from said selected point during substantially the first one-third of their said arcs of travel;

(d) then increasing the horizontal component of the thrust force sufficiently to so buckle the said upper sidewall portion between said localized area and bead as to displace and thereby shift a greater part of the upper sidewall to the other side of center of the rim;

(e) causing said bead deflectors to progressively deflect said bead over the upper rim flange during substantially the second one-third of their said arcs of travel; and then

(f) elevating the point of application of said thrust force and moving same radially further inward, whereby to cause the tire casing to twist downward and inward at the section at which the thrust force is applied, sufficiently to draw out of the drop center the lower bead part theretofore therein and press the upper bead portion fully into the

drop center thereat, thus to permit the upper sidewall to shift farther beyond center; and

(g) continuing the progression of the bead deflectors during the final portion of their arcs of travel, whereby to complete the bead deflection over the upper flange of the rim.

4,093,016

CURTAIN COATING METHOD AND APPARATUS AND THE MANUFACTURE OF PAPERBOARD

John Douglas Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 477,380, Jun. 7, 1974, Pat. No. 3,992,252. This application Jul. 27, 1976, Ser. No. 709,068

Claims priority, application Australia, Jun. 7, 1973, 3579/73

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—124 **2 Claims**

1. A method of making multi-ply paperboard comprising the steps of depositing paper pulp onto a forwardly travelling carrier web at locations spaced along the carrier web to form successive superimposed paper plies and applying starch solution to the upper surface of at least one of the plies onto which a succeeding ply is superimposed and before said succeeding ply is formed; the starch solution being applied to said ply surface by the technique of introducing a forced flow of starch solution into a chamber which is disposed above the carrier web in advance of the location at which said succeeding ply is to be formed and which has an upright side wall with a horizontal slot outlet of vertical width in the range of 1/16 inch to ¼ inch, maintaining the forced flow of starch solution into the chamber whereby in the vicinity of the slot outlet the starch solution is maintained within the chamber at a level above the upper edge of the slot outlet such that the starch solution is extruded horizontally from the slot outlet as a horizontal stream contacting both the upper and lower edges of the slot outlet and of thickness determined by the vertical width of the slot outlet, allowing the stream issuing from the slot outlet to fall downwardly under gravity across an upright surface which terminates at a bottom blade edge at a distance below said horizontal slot outlet such that the falling starch solution forms a continuous curtain which is attenuated as it flows down said upright surface to a thickness less than that of the horizontal stream extruded from said slot outlet, and allowing the attenuated continuous curtain to fall away from said upright surface at the blade edge and to drop onto said ply surface.

4,093,017

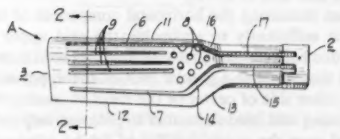
CORES FOR INVESTMENT CASTING PROCESS

John J. Miller, Jr., South Euclid; Donald L. Eppink, and Ted A. Loxley, both of Mentor, all of Ohio, assignors to Sherwood Refractories, Inc., Cleveland, Ohio

Filed Dec. 29, 1975, Ser. No. 644,939

Int. Cl.[2] B22C *1/02, 9/04, 9/10, 9/12*

U.S. Cl. 164—28 **12 Claims**



1. In a directional solidification casting process for precision casting of superalloys wherein a molten metal alloy at a temperature above 1500° C. is caused to flow into a preheated multi-layer refractory shell mold containing a preformed porous leachable vitreous silica core body and is caused to solidify progressively from the bottom of the mold over a period of time, said shell mold and said core body being preheated to a temperature of from 1300° to 1600° C., the improvement which comprises providing the preformed core body with a mineralizer containing devitrifying metallic ions which promote formation of cristobalite, a silica content of at least 90 percent by weight, and a limited amount of impurities so that the core body retains rigidity at high temperatures in excess of 1600° C. and converting at least 80 percent of the silica of said body to cristobalite before the molten metal is allowed to flow into the shell mold, the preformed core body containing from 35 to 55 percent by weight of cristobalite before being located in said shell mold.

12. A precision porous leachable refractory core for hight-emperature precision investment shell mold casting of aircraft turbine engine airfoils from superalloys comprising at least 95 percent by weight of silica and no more than 55 percent by weight of cristobalite, said core containing at least 35 percent by weight of cristobalite and from 0.04 to 0.2 percent by weight of alkali metal ions that promote the formation of cristobalite, said alkali metal ions being present in an amount such that preheating of said core for ½ hour at a temperature of about 1400° C. will convert at least 60 percent by weight of the silica to cristobalite, said core being formed from a refractory composition containing finely divided refractory particles and a binder, said refractory particles comprising at least 75 percent by weight of high-purity silica particles with a purity of at least 99.5 percent by weight and up to 25 percent by weight of added mineralizer particles with a particle size not in excess of 50 microns containing at least 0.2 percent by weight of alkali metal ions, said mineralizer particles being treated with a sodium compound to provide said devitrifying metallic ions and to cause sodium ions to be concentrated at the outer surfaces of said mineralizer particles, the percentage by weight of said metallic ions in said mineralizer particles being at least several times that in said high-purity vitreous silica particles, said core having a modulus of rupture of at least 700 pounds per square inch and a porosity of from 20 to 40 volume percent.

4,093,018

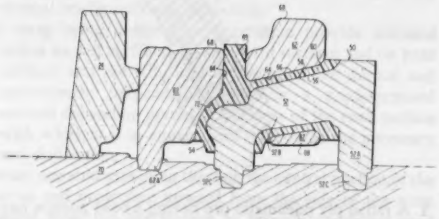
CASTING METHODS WITH COMPOSITE MOLDED CORE ASSEMBLY

David V. Trumbauer, Bremer, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 19, 1976, Ser. No. 733,958

Int. Cl.[2] B22C *9/04, 9/24, 9/10*

U.S. Cl. 164—32 **9 Claims**



1. A method of casting metal castings comprising the steps of:

forming a composite core assembly by:

fabricating a first core having an irregular outer surface portion;

molding a destructible layer of cellular plastic material around said irregular outer surface portion of said first core, such that an inner surface of said layer intimately contacts and conforms to the configuration of said irregular outer surface portion of said first core to interlock said first core and said plastic layer together, and such that the outer surface of said plastic layer includes an irregular surface portion; and

molding a second core in encompassing relation around said irregular outer surface portion of said plastic layer, such that an inner surface of said second core intimately contacts and conforms to the configuration of the irregular outer surface portion of said plastic layer to interlock said second core and said plastic layer together, and such that the outer surface of said second core is of nonconforming shape relative to the outer surface of said plastic layer;

forming a mold cavity within a pair of mold halves;

inserting said core assembly as an integral unit within one of said mold halves;

securing said mold halves together; and

introducing molten metal into said cavity to destroy said plastic layer and form said casting.

4,093,019

METHOD OF PRODUCING SMALL SHAPED PARTS BY CASTING FROM METAL AND APPARATUS FOR PERFORMING THE METHOD

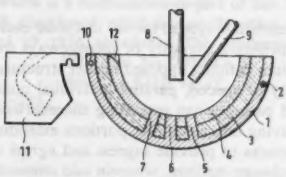
Rolf Seybold, and Gerd Gross, both of Solingen, Germany, assignors to Firm Piel & Adey, Solingen, Germany

Filed Jul. 16, 1976, Ser. No. 705,784

Claims priority, application Germany, Jul. 19, 1975, 2532402

Int. Cl.[2] B22D *27/04*

U.S. Cl. 164—52 **7 Claims**



1. A process for the production of small molded components by casting high alloy steel, and metal alloys similar to said alloy steels with respect to their melting temperatures and melting heat, in a crucible, and particularly, in a gravity die, comprising the steps of:

limiting the maximum amount of metal to be melted down in the crucible at any given time to the charge weight necessary for casting into a single die plus an amount of the metal sufficient to form a metal heel for heat retention;

supplying heat electrically to the charge being heated to casting temperature;

casting the metal into a die;

interrupting the heating of the charge during the casting step; and

retaining in the crucible a metal heel during the casting step, the heat content thereof compensating for at least a portion of the heat loss occurring from the metal during the heat interrupting step to maintain the pourability and castability of the metal in the crucible.

4,093,020

VAPOR-TYPE HEAT EXCHANGER

John R. Schieber, Holland, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 26, 1976, Ser. No. 670,787

Int. Cl.[2] F28B *5/00*; F28F *21/00*; G01N *25/00*

U.S. Cl. 165—1 **23 Claims**

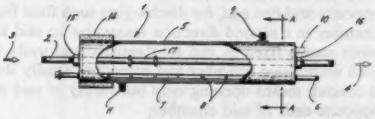
1. A method of exchanging thermal energy between cooling fluid and hot fluid comprising the steps of:

conducting the cooling fluid through thermally conductive conduit means surrounded by shell means,

injecting the hot fluid in the vapor phase into the shell means,

drawing the hot fluid from the shell means in the liquid phase,

maintaining the conduit means submersed in the liquid phase of the hot fluid, and directing the vapor phase of the hot



fluid into the liquid phase thereof not directly against said conduit means and not directly against said shell means to provide

jet mixing the liquid phase of the hot fluid with the vapor phase thereof.

4,093,021

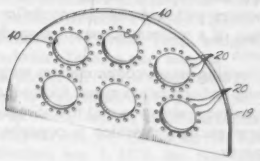
INSTRUMENT AND PANEL COOLING APPARATUS

Kenneth Dale Groom, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1975, Ser. No. 645,140

Int. Cl.[2] F28F *9/22, 13/12*

U.S. Cl. 165—1 **11 Claims**



1. A method of cooling an enclosed instrument panel and an instrument in an aperture in said panel comprising: inducing flow of a plurality of individual jets of cooling air near the face end of said instrument; providing spacing for and directing each of said individual jets of cooling air in a direction perpendicular to the face of said instrument in a manner for forming a cooling air flow path comprising a sheet a short distance from said panel and close enough to said aperture so that said sheet attaches to a surface of said instrument; and exhausting said cooling air from said enclosed instrument panel.

4,093,022

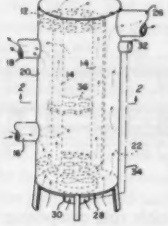
HEAT EXCHANGER

George Polyak, Jr., R.D. #1, Box 131B, Mt. Hope, Wharton, N.J. 07885

Filed May 2, 1977, Ser. No. 792,780

Int. Cl.[2] F28D *7/00*

U.S. Cl. 165—39 **9 Claims**



1. A heat exchanger, comprising:

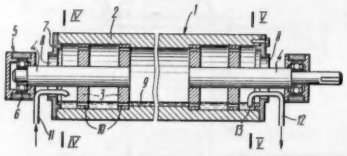
a cylindrical chamber having a vertical, elongate axis;
said chamber being closed at opposite axial ends thereof;
first means for admitting a heated fluid into said chamber, in a first direction transverse to said axis, adjacent one end of said chamber;
second means, adjacent an end of said chamber which is opposite said one end, for discharging such fluid from said chamber in a second direction transverse to said axis;
conduit means fixed in and substantially uniformly distributed within said chamber and extending axially thereof;
said conduit means opening only outwardly of said one and opposite ends of said chamber;
third means for admitting ambient air into said conduit means; and
fourth means for discharging air from said conduit means; wherein
said third and fourth means comprise a housing which substantially envelops said chamber;
said housing having a substantially cylindrical wall which terminates in a closed end wall;
said end wall being adjacent to, but spaced apart from, said one end of said chamber; and
said wall has a portion thereof which defines a compartment means cooperative with said fluid admitting and discharging means and said air admitting and discharging means to cause ambient air repetitively to cycle or pumpingly circulate through said conduit means and said compartment means;
said portion of said wall is eccentric relative to said chamber and cooperates with said chamber to define said compartment means of a uniform, crescent-shaped cross-section; and wherein
said air discharging means communicates with said compartment means, and comprises means for discharging air from said compartment means in said first direction from a side of said heat exchanger which is opposite said first and second means.

4,093,023

SHEET MILL TABLE ROLL

Ivan Vasilievich Frantsenjuk, ulitsa Parkovaya, 3, kv. 15; Andrei Dmitrievich Belyansky, ulitsa Parkovaya, 3, kv. 16; Leonid Semenovich Bobylev, prospekt Mira, 11, kv. 22; Zinovy Petrovich Karetny, prospekt Mira, 27, kv. 7, all of Lipetsk; Nikolai Nikitievich Alexandrov, Sharikopodshipnikovskaya ulitsa, 2, kv. 147, Moscow; Vasily Ivanovich Kulikov, Krasnodarskaya ulitsa, 12, kv. 113, Moscow; Evgeny Vladimirovich Kovalevich, Frunzenskaya naberezhnaya, 24, kv. 38, Moscow; Viktor Gurievich Tinyakov, Juzhno-Portovaya ulitsa, 16, kv. 23, Moscow; Alexandr Vladimirovich Bolotnov, Kavkazsky bulvar, 47, kv. 37, Moscow; Jury Alexandrovich Chernov, prospekt Lenina, 30, kv. 50, Alma-Ata; Vladimir Mikhailovich Kolesov, ulitsa Kirova, 89, kv. 10, Alma-Ata; Nikolai Matveevich Svetlakov, 6 Mikroraion, 10a, kv. 50, Alma-Ata; Gennady Nikolaevich Burmistrov, mikroraion "Orbita-I", 25, kv. 74, Alma-Ata, and Jury Grigorievich Kuxenko, ulitsa 12 Linia, 67, Alma-Ata, all of U.S.S.R.

Filed Jun. 24, 1976, Ser. No. 699,438
Int. Cl.[2] F28D *11/02*
U.S. Cl. 165—89 **4 Claims**



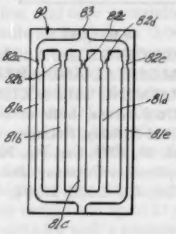
1. A sheet mill table roll, comprising: a cylindrical hollow body; half-axles accommodated within said cylindrical hollow body and mounted on table bearing supports; said cylindrical hollow body having hubs fixed on said half-axles; through channels provided at the periphery of said hubs; covers mounted on each end face of said hollow body; a central port provided in each said cover and having a diameter essentially smaller than the outside diameter of said hub and; annular slots formed by said covers and said half-axles.

4,093,024

HEAT EXCHANGER EXHIBITING IMPROVED FLUID DISTRIBUTION

Verne L. Middleton, East Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 15, 1976, Ser. No. 696,203
Int. Cl.[2] F28F *3/12, 9/22, 27/02;* F24J *3/02*
U.S. Cl. 165—170 **17 Claims**



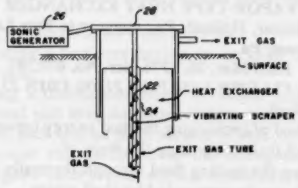
1. A heat exchange system for use in a solar energy collector system comprising a plurality of passageways for a heat exchange medium defining opposed header structures connected by a plurality of spaced, parallel individual connecting portions of said passageways extending therebetween, said passageways having entry and exit portions extending from said header structures to provide ingress and egress openings for said heat exchange medium, wherein said connecting portions are provided with a plurality of constrictions in internal diameter extending along at least a portion of the length thereof wherein at least some of said constrictions have differing internal diameter so that the constriction adjacent the area of greatest turbulence and fluid flow has the smallest internal diameter over at least a portion of its length and the constriction on individual connecting portions have gradually increasing internal diameter in relation to increased distance from said area of greatest turbulence, said constrictions serving to divert fluid away from the connecting portion receiving the primary amount of flow and to regulate the rate of flow of said heat exchange medium between all of said connecting portions.

4,093,025

METHODS OF FLUIDIZED PRODUCTION OF COAL IN SITU

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Division of Ser. No. 595,335, Jul. 14, 1975, Pat. No. 4,069,868. This application Nov. 23, 1976, Ser. No. 744,258
Int. Cl.[2] E21B *43/24, 45/62*
U.S. Cl. 166—251 **2 Claims**



1. A method of producing coal in situ comprising the steps of

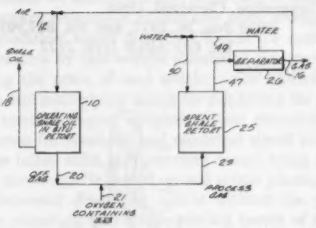
drilling wells into a coal formation,
taking oriented cores in the coal formation,
testing the coal formation for water content,
completing the wells so that they are hermetically sealed,
installing facilities at the surface to inject fluids into the coal formation and to remove fluids from the coal formation,
removing water from the coal formation,
igniting the coal formation,
removing the products of combustion from the coal formation,
installing a heat exchanger in the wells used to withdraw fluids from the coal formation,
extracting and recovering sensible heat from withdrawn fluids, and
producing sonic vibrations in the withdrawal wells to prevent the build-up of particulate matter in the wells.

4,093,026

REMOVAL OF SULFUR DIOXIDE FROM PROCESS GAS USING TREATED OIL SHALE AND WATER

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 760,038, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 593,622, Jul. 7, 1975, abandoned, which is a continuation of Ser. No. 492,822, Jul. 29, 1974, abandoned. This application Apr. 15, 1977, Ser. No. 787,887
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—256 **21 Claims**



2. A method for removing sulfur dioxide from a process gas comprising the steps of:
passing a process gas containing sulfur dioxide through a fragmented permeable mass of particles containing treated oil shale and including alkaline earth metal oxides, said mass including water for combining with alkaline earth metal oxides in the fragmented mass and sulfur dioxide in the process gas for removal of sulfur dioxide from the process gas.

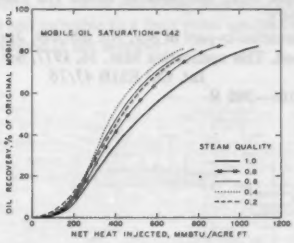
4,093,027

METHOD OF ASSISTING THE RECOVERY OF OIL USING STEAM

Ezzat E. Gomaa, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 1, 1976, Ser. No. 746,564
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 **3 Claims**

1. In a method of assisting the recovery of hydrocarbons from a hydrocarbon-bearing formation wherein steam is injected through an injection well into a hydrocarbon-bearing formation to promote a flow of hydrocarbons to a production well for production therefrom, the improvement comprising



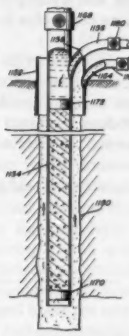
maintaining the quality of the steam injected into the formation within a range of from 35 to 45%.

4,093,028

METHODS OF USE OF CEMENTITIOUS MATERIALS AND SONIC OR ENERGY-CARRYING WAVES WITHIN SUBSURFACE FORMATIONS

Clarence W. Brandon, Nashville, Tenn., assignor to Orpha B. Brandon, Nashville, Tenn., a part interest

Continuation-in-part of Ser. No. 406,045, Oct. 12, 1973, Pat. No. 3,981,624, which is a continuation-in-part of Ser. No. 611,082, Jan. 23, 1967, Pat. No. 3,765,804, which is a continuation-in-part of Ser. No. 665,995, Jun. 17, 1957, Pat. No. 3,302,720, This application Sep. 7, 1976, Ser. No. 721,605
Int. Cl.[2] E21B *33/138, 33/14*
U.S. Cl. 166—281 **51 Claims**



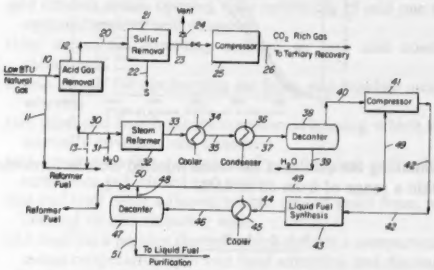
1. A method of cementing casing, liner or tubing in a well bore comprising the steps of
introducing into a well casing, liner or tubing a charge of cement under pressure of the compression portion of a sonic or energy-carrying wave, and
displacing drilling mud or other debris in said well bore below or between said casing, liner or tubing and the walls of said well bore by said charge of cement,
including introducing a fluid composed of or containing a gas, foam, emulsion or solvent into said casing, liner or tubing prior to the introduction of cement under pressure of said compression portion of said sonic or energy-carrying wave,
wherein said fluid becomes gaseous or vaporous during at least a rarefied portion of said sonic or energy-carrying wave.

4,093,029

UTILIZATION OF LOW BTU NATURAL GAS

Paul Burg Weisz, Yardley, Pa., and John Clarence Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 698,449, Jun. 21, 1976, abandoned. This application Mar. 24, 1977, Ser. No. 780,743
Int. Cl.[2] E21B 43/16
U.S. Cl. 166—305 R 5 Claims



1. A process for economic utilization of natural gas, having low heating value by reason of containing carbon dioxide in admixture with the methane content thereof, which process comprises subjecting a natural gas having substantial methane content in admixture with at least 50 volume percent of carbon dioxide based on total volume of said gas to the following steps in the sequence recited:

(a) removing a substantial portion of the acid gases from said natural gas to leave a reformer feed gas containing 20–40 mol percent carbon dioxide;

(b) mixing said reformer feed gas with water and reacting the mixture in contact with a catalyst to promote the reforming reaction of methane and water to produce carbon monoxide and hydrogen under temperature and pressure conditions conducive to said reforming reaction; and

(c) reacting the product of step (b) in contact with a carbon monoxide reduction catalyst for promotion of synthesis reaction between carbon dioxide, carbon monoxide and hydrogen to produce methanol or hydrocarbons, which are liquid at normal temperature of 21° C (70° F) and atmospheric pressure, under conditions of temperature and pressure conducive of said synthesis.

4,093,030

RUN-IN AND TIE BACK APPARATUS

James Vaull Bonds, Houston, Tex., assignor to McEvoy Oilfield Equipment Company, Houston, Tex.

Division of Ser. No. 543,123, Jan. 22, 1975, Pat. No. 4,646,405, which is a continuation of Ser. No. 253,516, May 15, 1972, abandoned. This application Jan. 24, 1977, Ser. No. 762,181
Int. Cl.[2] E21B 23/00, 43/10
U.S. Cl. 166—315 6 Claims

1. A method of completing a well comprising:

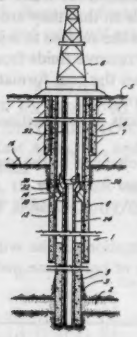
lowering a casing hanger suspending a casing string into the well by means of handling pipe until the casing hanger lands on a support affixed within the well;

securing the casing string in the well;

disconnecting the handling pipe from the casing hanger by a rotation of the handling pipe;

removing the handling pipe from the well;

lowering riser casing into the well;



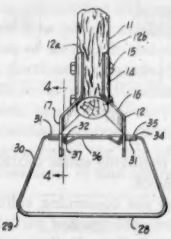
connecting the riser casing to the casing hanger by rotating the riser casing in the same direction as used for disconnecting the handling pipe.

4,093,031

PENDULUM TYPE HOE

William E. Portz, North Madison, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Jun. 24, 1977, Ser. No. 809,901
Int. Cl.[2] A01B 1/10, 1/22
U.S. Cl. 172—372 14 Claims



1. A pendulum type hoe comprising a handle;

a fork secured to one end of said handle and comprising a pair of laterally spaced, parallel leg portions extending beyond said one end;

said leg portions having elongated slots therein disposed at an angle relative to said leg portions whereby the longer axes of said slots are generally horizontal when said handle is disposed at a normal working angle;

a blade having a pair of upwardly angled arms;

the upper ends of said arms having inwardly turned flanges projecting inwardly through said slots toward each other;

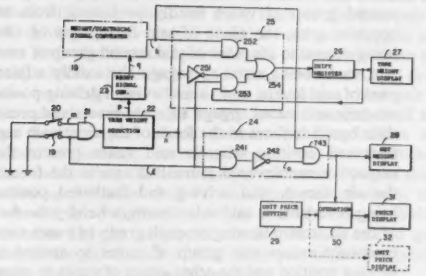
a reinforcing member having bifurcated end portions projecting through said slots and affording laterally directed openings receiving said flanges;

said flanges and said bifurcated end portions having a combined thickness smaller than the vertical width of said slots whereby to allow limited articulation of said blade with respect to said fork.

4,093,032
ELECTRONIC WEIGHING APPARATUS

Noboru Uyama, Osaka, and Katsuaki Hara, Tondabayashi, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 6, 1976, Ser. No. 747,783
Claims priority, application Japan, Dec. 8, 1975, 50-147147
Int. Cl.[2] G01G *13/14, 23/22*
U.S. Cl. 177—165 8 Claims



1. An electronic weighing apparatus for weighing an article in a packing, which packing constitutes a tare weight, comprising: displacement means responsive to the weight of an article being weighed for causing a displacement associated with the weight of said article, said displacement means comprising means for placing said article thereon, electrical signal providing means responsive to the displacement of said displacement means for providing an electrical signal associated with the displacement of said displacement means and thus with the weight of said article, weight display means responsive to said electrical signal providing means, for displaying the weight of said article, means for setting the unit price data of said article, multiplying means responsive to said unit price setting means and to said electrical signal providing means for multiplying said unit price data by said weight associated electrical signal for evaluating the price of said article, price display means responsive to said multiplying means for displaying the price of said article, resetting means coupled to said electrical signal providing means for resetting said electrical signal providing means into an initial state, said resetting means being enabled when only a tare weight is placed on said article placing means of said displacement means, an article without the packing being further placed on said article placing means of said displacement means after said resetting means is enabled, disabling means responsive to said resetting means for disabling said price display means before said resetting means is enabled, wherein said disabling means if further responsive to said resetting means for also disabling said weight display means before said resetting means is enabled, said apparatus further comprising shift register memory means responsive to said resetting means for storing said weight associated electrical signal representative of tare weight before said resetting means is enabled, means responsive to said memory means for displaying said tare weight, and means responsive to said resetting means for selectively applying said weight associated electrical signal to said shift register means only before said resetting means is enabled.

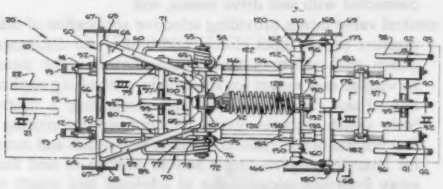
4,093,033
SNOWMOBILE SUSPENSION SYSTEM

Hubert J. Rosch, Plymouth, Minn., assignor to Kawasaki Motors Corp., U.S.A., Santa Ana, Calif.

Filed Feb. 24, 1977, Ser. No. 771,800
Int. Cl.[2] B62M *27/02*
U.S. Cl. 180—5 R 8 Claims

1. In a suspension system for the body of a track driven vehicle having a suspension frame slidably supported on a ground-engaging track and a suspension assembly mounted on the frame for yieldably supporting one end of the body, the provision of a suspension assembly for the other body end comprising:

a longitudinally resilient member having one end connected to said frame, the other end being normally located at a rest point and movable to a limit point against restorative force produced in the member;

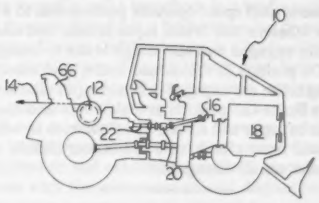


and linkage means connected between said rest point and said other body end for translating downward displacement of said other body end relative to the frame into longitudinal movement of said rest point toward said limit point, including means for increasing the ratio of said movement relative to said displacement as the other end of the resilient member approaches the limit point.

4,093,034
VEHICLE SUPPORTED WINCH

Francis M. Curley, Metamora, and James L. Schmitt, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 15, 1975, Ser. No. 640,515
Int. Cl.[2] B60K *17/28*
U.S. Cl. 180—53 R 3 Claims



1. In a vehicle having an engine and a supported winch which comprises a supported rotatable drum for receiving and releasing a cable, means for selectively transmitting rotary motion to said drum having clutch and brake means, said clutch and brake means including a normally disengaged input clutch which drivingly engages on application of fluid pressure thereto, a normally engaged brake for stopping rotation of said transmitting means in a reel-out direction which releases on application of fluid pressure thereto, a normally engaged disconnect clutch which disengages said drum from said transmitting means on application of fluid pressure thereto and a normally disengage viscous drag brake which engages on application of fluid pressure thereto to create a drag on said drum opposing loosening of said cable, pump means serving as a source of pressurized fluid and means communicating said pump means for selectively controlling application of said pressurized fluid to said input clutch, said normally engaged brake, said disconnect clutch and said drag brake, an improvement comprising:

an accumulator communicating with said pump means for storing said pressurized fluid under pressure produced by said pump means when it functions and for supplying said pressurized fluid when functioning of said pump means is retarded;

a change speed transmission driven by said engine;

rotary means driven by said transmission for imparting ro-

tary motion to said means for selectively transmitting rotary motion to said drum; and

drive means driven by said rotary means, said drive means driving said pump, functioning of said pump being retarded as said transmission stalls whereby said accumulator supplies said pressurized fluid, said rotary means including a shaft extending from said transmission drivingly connected with said drive means; and

control valve means providing selective application of fluid pressure to said input clutch, said brake, said disconnect clutch and said drag brake, said control valve means serving as said means for selectively controlling application of said pressurized fluid and comprising: a control body which includes means for continuously routing a first portion of said fluid to lubricate said winch and means for intermittently routing a second portion of said fluid away from said accumulator to lubricate said winch responsive to said accumulator fluid pressure reaching a preselected value, said body having (1) a fluid passage receiving fluid from said pump means, (2) a first branch passage as part of said continuous routing means and through which said first portion of said fluid flows via a restricted orifice, (3) a second branch passage in flow communication with a control spool which directs said second portion of said fluid to said intermittent routing means when accumulator pressure reaches said preselected value, (4) a third branch passage communicating via check valve means with said accumulator, (5) a logic slug receiving fluid pressure from said accumulator, delivering fluid pressure to move said control spool when said accumulator pressure reaches said preselected value into position for routing said second portion of said fluid to lubricate said whinch and providing path means for the fluid delivered to move said control spool when said accumulator pressure reaches said preselected value, and (6) a control shift spool operator positionable to a Reel-In position wherein said brake, input clutch, and disconnect clutch are engaged and said drage brake is disengaged, a Brake-On position in which said brake, disconnect clutch and drag brake are engaged and said input clutch is disengaged, a Brake-Off position in which only said disconnect clutch is engaged and a Free-Spool position in which said brake, said input clutch, said disconnect clutch, and said drag brake are all disengaged.

4,093,035

FLUID MILL POWERED VEHICLE

Orval K. Fletcher, Rte. 2, Bruce, Wis. 54819

Filed Jun. 3, 1977, Ser. No. 803,220
Int. Cl.² B60K *1/00*
U.S. Cl. 180—65 DD **7 Claims**

1. In an electric powered vehicle having a source of electric power supplying power to at least one electric motor operatively connected to a wheel of the vehicle, the improvement comprising in combination:

a. a fluid mill for developing power in response to an air stream flowing therepast, said fluid mill comprising in combination:

i. frame members secured to the vehicle for supporting said fluid mill;

ii. at least one pair of axles journalled in said frame members normal to the flow of the air stream;

iii. a plurality of spaced levers journalled in each axle of said pair of axles and having opposite arms extending from said axle, each of said levers being axially spaced along the respective one of said axles;

iv. a first set of vanes disposed about one of said axles and a second set of vanes disposed about another of said axles, each said set of vanes comprising: a first and a second group of vanes fixedly projecting from said opposite arms, the plane of said first group of vanes being normal to the plane of said second group of vanes, said vanes being sized to engage the axially adjacent ones of said levers, said vanes having a driving position wherein said vanes engage adjacent levers and present their broad surfaces to the force of the air stream and a feathered position wherein said vanes present their respective cantilevered journalled arm to the force of the air stream, said driving and feathered positions being reversible as said axle rotates, whereby the force of the air stream bearing on each group of vanes simultaneously causes one group of vanes to assume the driving position and the other group of vanes to assume the feathered position, the functions of the groups of vanes alternating as the force of the air stream against the group of vanes in the driving position turns said levers which in turn rotate the said axle;

b. means for taking power off of each said pair of axles for transmission to a point of use;

c. means for producing electrical power in response to said power take off means; and

d. means for transmitting the electrical power to charge the electric power source;

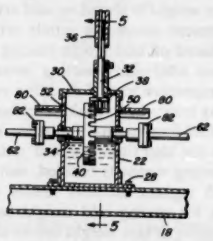
whereby, motion of the vehicle produces an air stream to operate said fluid mill and charge the electric power source.

4,093,036

IRRIGATION TOWER DRIVE

Glenn C. Knutson, Rte. 1, Box 141, Centerville, S. Dak. 57014

Filed Sep. 7, 1976, Ser. No. 721,322
Int. Cl.² B60K *17/04*
U.S. Cl. 180—70 R **3 Claims**



1. In combination with an irrigation tower including support and driven wheel means for supporting and driving said tower from and over ground to be irrigated, said tower including a first pair of generally right angularly disposed driven and drive shafts journalled therefrom, compact numerically high ratio drive means drivingly connecting said drive shaft to said wheel means, said drive means including first driven means driving said drive shaft from said driven shaft, said first drive means including a pair of gear wheels consisting of a first small diameter gear wheel on said driven shaft having a plurality of rollers generally paralleling, supported from and spaced equally about and radially outwardly from said driven shaft and journalled from the latter and a second large diameter gear wheel mounted on said drive shaft, said second gear wheel including an outer peripheral cylindrical portion having a plurality of axially outwardly opening notches formed in and spaced about one axial end of said outer peripheral portion, said first gear

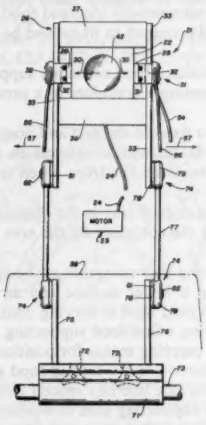
wheel being disposed in meshed engagement with said second gear wheel with successive rollers of said first gear wheel engageable in the notches spaced about said outer peripheral portion, said notches being generally U-shaped in configuration, said drive means including second drive means including a second pair of right angularly disposed driven and drive shafts having first and second small and large diameter gear wheels thereon including rollers and notches, respectively, corresponding to the first mentioned rollers and notches and meshed with each other, the drive shaft of the first pair of shafts driving the driven shaft of said second pair of shafts, said driven shaft of said second pair of shafts being driven from and coaxial with the drive shaft of said first pair of shafts, said drive means including third drive means including a third pair of driven and drive shafts also having first and second small and large diameter gear wheels thereon including rollers and notches, respectively, corresponding to the first mentioned rollers and notches, the drive shaft of said second pair of shafts comprising the drive shaft of said third pair of shafts, said driven and drive shafts of said third pair of shafts paralleling each other and the peripheral notches on said second gear wheel of the drive shaft of said third pair of shafts opening radially outwardly of that drive shaft.

4,093,037

HEAD ACTUATED CONTROL APPARATUS FOR BATTERY-POWERED WHEELCHAIR

William Wanet Miller, III, 2533 Hillegass St. Apt. 101, Berkeley, Calif. 94704

Filed May 10, 1976, Ser. No. 684,759
Int. Cl.[2] B60K *26/00*
U.S. Cl. 180—77 R **4 Claims**



1. Control apparatus for use in controlling the position of a reclinable back on a battery-powered wheelchair having a headrest and an electrically powered back reclining mechanism, said apparatus including a first switch and a second switch formed for mounting proximate said headrest, said first switch being formed for electrical connection to said back reclining mechanism to effect reclining of said back and said second switch being formed for electrical connection to said back reclining mechanism to effect raising of said back, said first switch and said second switch each including actuating elements formed for engagement by the head of the user of said wheelchair, wherein the improvement in said control apparatus comprises:

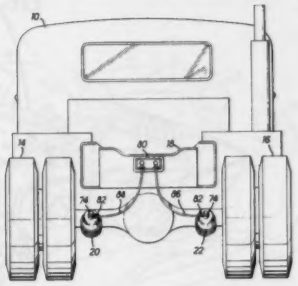
said actuating elements being formed for mounting proximate said headrest to extend in a direction generally parallel to the back of the wheelchair over a distance enabling engagement thereof by the head of the user when the back of the wheelchair is in the fully reclined position.

4,093,038

SPRING BRAKE ASSEMBLY

Neil Leroy Molin, New Brighton, Minn., assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 12, 1976, Ser. No. 741,243
Int. Cl.[2] B60T *7/00*
U.S. Cl. 180—82 R **2 Claims**



1. A spring brake assembly for a truck tractor of the type having a chassis and a cab, said spring brake assembly, comprising, a chassis frame portion disposed immediately behind said cab and a rear axle unit at the rear of said chassis, a spring brake actuator mounted on said rear axle, a filter unit mounted on said chassis frame portion and hose means connecting said actuator and said filter unit; said actuator including casing means defining a chamber, a flexible diaphragm dividing said chamber into first and second chamber sections, push rod means in said first chamber section engaging said diaphragm and being movable away therefrom in a brake applying direction and towards thereto in a brake releasing direction, return spring means biasing said diaphragm in a brake releasing direction, first port means through which said first chamber is alternately pressurized and depressurized, emergency spring means in said second chamber for moving said diaphragm and said push rod in a brake applying direction when said first chamber is depressurized, second port means through which air is admitted to and exhausted from said second chamber in accordance with the movement of said diaphragm; said filter unit comprising a rectangularly shaped box-member having front and rear spaced apart walls and being mounted on said chassis frame portion, fitting means on said rear facing wall, a sponge rubber filter in said filter unit adjacent said rear wall and spaced from said front wall to form a filter chamber, filter box port means at the lower part of said box member providing fluid communication between said filter chamber and the surrounding atmosphere; and hose means connecting said spring brake actuator second port means to said filter unit fitting means.

4,093,039

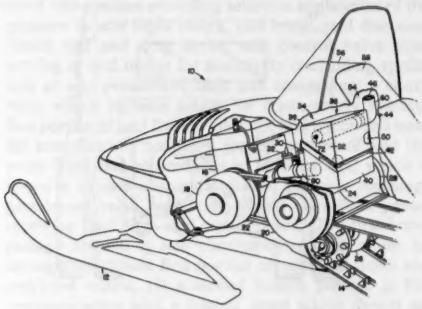
AIR INTAKE SILENCER

James Walter Moore, and Stephen Alphonse Braun, both of Horicon, Wis., assignors to Deere & Company, Moline, Ill.

Filed May 10, 1976, Ser. No. 684,593
Int. Cl.[2] F01N *1/00*; F02M *35/00*
U.S. Cl. 181—229 **6 Claims**

1. An expansion chamber for an air intake silencer, comprising: upper and lower identically dimensional and configured chamber halves; said upper chamber half including a closed top wall joined to a depending wall means having a lower end defined by a first flange and terminating in first plane inclined upwardly from a rear location to a front location of the lower end; said lower chamber half including a closed bottom wall joined to an upright wall means having an upper end defined by a second flange and terminating in a second plane which is parallel to the first plane; said first and second flanges defining

respective connection surface means which cooperate to form a telescopic joint whereby the lower and upper ends respectively of the depending and upright wall means are releasably joined together; an air inlet opening means being provided in the depending wall means of the upper chamber for connection to a tubular inlet member; and an air outlet opening means, for connection to carburetor intake means, being provided at a



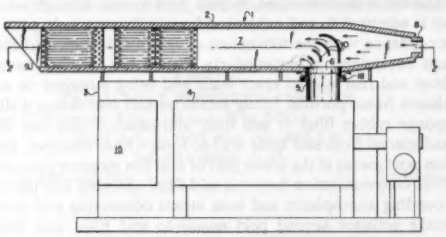
forward location in the upright wall means of the lower chamber at a level which places at least a portion of the outlet opening means at a level above a rear location of the second flange whereby easy access may be had to the air outlet opening means, when the upper chamber half has been disconnected from the lower chamber half, so that carburetor adjustments may be made by inserting a tool through the outlet opening means.

4,093,040

SILENCER AND COOLER FOR PUMP UNIT

Kenneth L. Treiber, 1103 Villamay Blvd., Alexandria, Va. 22307

Filed Dec. 21, 1976, Ser. No. 753,149
Int. Cl.[2] F01N *7/00, 7/14*
U.S. Cl. 181—252 **3 Claims**



1. An exhaust silencing and cooling system for engines comprising:

a silencing and cooling unit having a axial passage therethrough, said passage having a first inlet for cooling air at one end, an outlet for cooled exhaust gases at the opposite end, and a second laterally directed exhaust gas inlet disposed between said first inlet and said outlet;

means for connecting said first inlet to a source of cooling air, and means for connecting said second inlet to the exhaust line of an engine;

first gas deflector means for directing laterally entering exhaust gases axially along said passage;

at least one pair of oppositely directed wedge-shaped barriers spaced so as to create an obliquely directed flow path located downstream of said first gas deflector;

a second deflector means located at the downstream end of said flow path for redirecting gases leaving said flow path into a generally axial direction; and

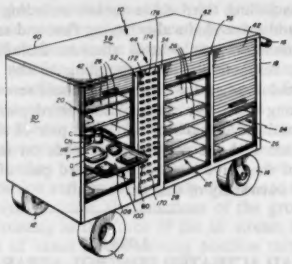
axially directed sound dampening guide vanes downstream of said second deflector means.

4,093,041

FOOD SERVING SYSTEM

Paul Davis, Swampscott, and David Schneider, Lexington, both of Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Apr. 19, 1976, Ser. No. 677,972
Int. Cl.[2] E04H *3/04*
U.S. Cl. 186—1 D **7 Claims**



1. A food serving system comprising

a mobile cart constructed and arranged to be rolled about the floor of an institution such as a hospital.

a low voltage rechargeable power pack on the cart,

an array of racks for food serving trays arranged in the cart,

a plurality of substantially identical food serving trays constructed and arranged to fit on and be removed from the racks,

at least one localized food container supporting area in each tray for orienting a container in a prescribed position on the trays,

electric heaters fixed to the cart and positioned to be in heat exchange relation with containers on the food container supporting areas on the trays when the trays are on the racks,

and an opening in each tray at the container supporting area for enabling the container on the area to directly engage the heater.

7. A food serving tray comprising a body of heat insulating material defining a lower surface and an upper surface for carrying hot and cold food in serving containers,

said body having a first food supporting area on said upper surface and carrying means for positioning a food serving container thereon and a second food supporting area on said upper surface laterally spaced from said first area,

said first food supporting area comprising a metallic insert extending from said upper to said lower surface and having high thermal conductivity properties to enable direct heat transfer through said body by conduction.

4,093,042

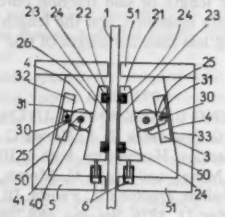
LOCKING GRIPPER

Jacques Pradon, 19, avenue de la Tourelle, 94100 - Saint-Maur-des Fosses, France

Filed Oct. 18, 1976, Ser. No. 733,361
Claims priority, application France, Oct. 20, 1975, 75 32025
Int. Cl.[2] F16D *63/00*
U.S. Cl. 188—67 **18 Claims**

1. In a gripper for locking against an elongated body and subject to a relative displacement along the length of the body and capable of locking at any place therealong, said gripper comprising a rigid member, at least two jaws provided with surfaces for locking against the body and means for locking the jaws transversely on the body by wedge effect comprising, for each jaw, a pair of substantially parallel bearing surfaces in-

clined relative to the elongated body, one surface being arranged on the corresponding jaw, the other on said rigid member, and at least one rolling member interposed between said bearing surfaces for transmission of the locking force of the associated jaw to the rigid body, the improvement comprising at least one shoe associated with each pair of bearing surfaces,



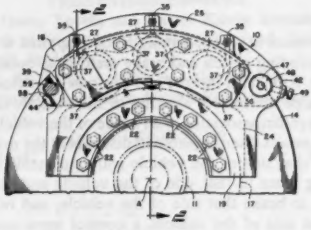
said shoe being provided with a surface for application against one of the bearing surfaces and elastic means connecting said shoe with the second bearing surface for maintaining the rolling member between said second bearing surface and a rolling surface provided on the shoe whereby force is transmitted between said bearing surfaces through said jaw, said roller and said shoe in succession.

4,093,043

CALIPER TYPE DISC BRAKE

Philip A. Smith, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 17, 1977, Ser. No. 778,533
Int. Cl.² F16D *55/228, 65/04*
U.S. Cl. 188—73.6 **8 Claims**



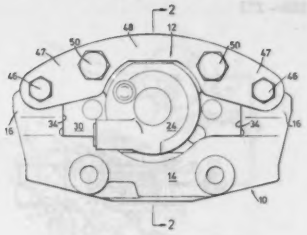
1. A caliper brake having a brake disc rotatable about an axis, a supporting body, a lining carrier positioned in a direction at one side of said disc, said lining carrier having ends spaced generally circumferentially of said disc, a first one of said ends having an opening for receiving a cylindrical torque pin mounted on said supporting body and extending axially of said disc to support said lining carrier and permit axial sliding movement of said lining carrier into and out of braking engagement with said disc, said opening comprising a round hole with the diametral clearance between said pin and the wall of said hole being the minumum required for sliding of said lining carrier axially of said disc, retention means between a second one of said ends and said supporting body for supporting said lining carrier in position, said retention means supporting said lining carrier while permitting sliding movement axially of said disc as well as circumferential movement toward and away from said torque pin to accommodate expansion and contraction of said lining carrier due to changes in temperature caused by the heat generated during braking and brake actuating means in engagement with said lining carrier moving said lining carrier axially into braking engagement with said disc.

4,093,044

SLIDING CALIPER DISC BRAKE

Hartmut Unterberg, Koblenz-Metternich, Germany, assignor to Girling Limited, Birmingham, England

Filed Feb. 15, 1977, Ser. No. 768,722
Claims priority, application United Kingdom, Feb. 18, 1976, 6310/76
Int. Cl.² F16D *55/224*
U.S. Cl. 188—73.3 **20 Claims**



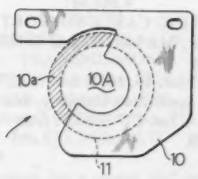
1. A sliding caliper disc brake comprising a carrier member for fixing to a vehicle; a caliper member adapted to straddle a minor portion of the periphery of a rotatable disc; guide means guiding said caliper member for sliding relative to said carrier member, said guide means including first and second receiving means containing openings, first connecting means joining said first and second receiving means to one of said caliper and carrier members, first and second pins which are snug sliding fits within said openings, and second connecting means joining said first and second pins to the other of said caliper and carrier members, one at least of said first and second connecting means including a resilient element; and an actuator for directly urging a friction pad onto one side of said disc to cause said caliper member to slide relative to said carrier member to apply by reaction an opposite friction pad to the other side of said disc.

4,093,045

NOISE PREVENTING MEANS FOR DISC BRAKES

Kouji Kawamura, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 5, 1977, Ser. No. 756,978
Claims priority, application Japan, May 19, 1976, 51-63806[U]
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.5 **8 Claims**



1. A brake noise or squeal preventing means for use in disc brakes of a type in which a rotatable disc in rotation is decelerated or stopped by a friction pad being urged via a piston having a thrust giving end and working in a hydraulic cylinder having an axis, the preventing means comprising a shim or plate member unfixedly interposed between said piston and said friction pad, said shim or plate member having a cut out portion thereof at a location where the same confronts with said thrust giving end of said piston on that side of said axis of said cylinder with which any given point on said disc first comes into alignment; and a coating of friction reducing material on at least one side of said shim or plate member confront-

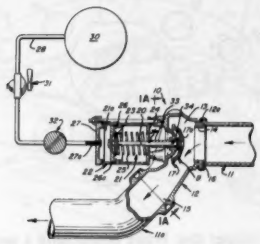
ing with said friction pad, in order to slide easily against said friction pad.

4,093,046

EXHAUST BRAKING APPARATUS

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 30, 1976, Ser. No. 755,970
Int. Cl.[2] F02D 9/06
U.S. Cl. 188—273 **6 Claims**



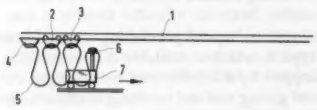
1. A modulating exhaust braking apparatus for a motor vehicle engine, comprising a first chamber disposed between a pair of complemental sections of an exhaust duct for the engine, said first chamber being provided with an inlet connected to one complemental duct section and an outlet connected to a second complemental duct section; closure means adjustably mounted within said first chamber for movement between first and second positions and, when in the first position, closing off exhaust gas flow through the first chamber and, when in the second position, permitting substantially unrestricted exhaust gas flow through the first chamber, said closure means being biased to normally assume said second position; a second elongated chamber separated from said first chamber and having one end wall thereof connected to a source of regulated pneumatic pressure; and a pneumatic pressure responsive means movably mounted within said second chamber, said responsive means having a surface portion remote from the second chamber end wall and operatively connected to said closure means, said responsive means effecting movement of said closure means from said second position to said first position and retaining same in said first position only when said responsive means is subjected to pneumatic pressure above a predetermined amount.

4,093,047

TRAVELLING CABLE SUPPORT SYSTEM

Manfred Wampfler, Markter Weg 5, D-7858 Weil am Rhein-Markt, Germany

Filed Mar. 16, 1977, Ser. No. 778,199
Claims priority, application Germany, Jun. 23, 1978, 2628112
Int. Cl.[2] H02G 11/06
U.S. Cl. 191—12 R **10 Claims**



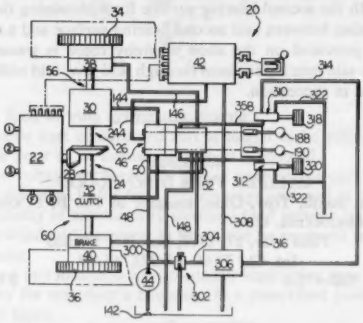
1. A travelling cable support system comprising:
a guide rail;
a plurality of conductor sleds slidably mounted upon said guide rail for movement therealong wherein the first conductor sled is adapted to pull the remaining conductor sleds;
a plurality of non-elastic traction cords respectively interposed between said conductor sleds;
at least one conductor carried by said conductor sleds; and
a plurality of elastomeric cords connecting together adjacent conductor sleds,
the length of said elastomeric cords being less than the length of said traction cords when said elastomeric cords are not tensioned and being capable of obtaining a greater length than the length of said traction cords when said traction cords are tensioned, and the length of said traction cords being less than the length of said conductor.

4,093,048

VEHICLE STEERING BRAKE AND CLUTCH CONTROL

Gary A. Hakes, North Brunswick, N.J.; Norma G. Shook, Morton; George W. Cackley, Hanna City, both of Ill.; Stephen D. Burdette, Edina, Minn., and Hugh C. Morris, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 21, 1976, Ser. No. 688,798
Int. Cl.[2] F16D 67/04; B60K 29/00
U.S. Cl. 192—13 R **32 Claims**



1. In a vehicle in which driving force is applied to both sides thereof, including clutch and brake systems associated respectively with both sides thereof and responsive to fluid pressure from a source thereof for steering of the vehicle, each clutch and brake system associated with a side of the vehicle comprising clutch means disengageable to disconnect the driving force applied to that side of the vehicle and engageable to connect the driving force to that side of the vehicle and brake means actuatable to brake that side of the vehicle, and releasable to release that side of the vehicle, a control apparatus for each clutch and brake system comprising:
a valve comprising a valve body defining a bore, and first and second valving spools movably disposed within and along said bore;
first means for providing fluid communication between said source and said valve body bore;
second means for providing fluid communication between said valve body bore and said clutch means;
third means for providing fluid communication between said valve body bore and said brake means;
fourth means for providing fluid communication from said valve body bore and through which fluid pressure may be released from said valve body bore;
the first valving spool being movable within said bore to first and second positions relative to said valve body, the first valving spool in one of said first and second positions allowing release of fluid pressure from said clutch means through said second fluid communication means and said fourth fluid communication means, the first valving spool in the other of said first and second positions providing communication of fluid pressure from said source through said first fluid communication means, through said second fluid communication means, to the clutch means;

the second valving spool being movable within said bore to first and second positions relative to said valve body, the second valving spool in one of said first and second positions providing communication of fluid pressure from said source through said first fluid communication means, through said third fluid communication means, to said brake means, the second valving spool in the other of said first and second positions allowing release of fluid pressure from said brake means through said third fluid communication means, and said fourth fluid communication means, and

actuator means operatively coupled with said first and second valving spools so that movement of said actuator means in one direction provides movement of the first and second valving spools to their respective first positions, and movement of the actuator means in another direction provides movement of said first and second valving spools to their respective second positions;

wherein said release of fluid pressure from said clutch means is allowed with said first valving spool in said first position, and wherein said communication of fluid pressure from said source to said brake means is provided with the second valving spool in said first position, wherein the first and second valving spools are movable in the same, first direction relative to the valve body from the first to the second positions thereof, and the first and second valving spools are movable in the opposite, second direction relative to the valve body from the second to the first position thereof, and wherein the brake means are applied upon release of fluid pressure therefrom, and released upon application of fluid pressure thereto, and further wherein the clutch means are applied upon release of fluid pressure therefrom, and released upon application of fluid pressure thereto.

4,093,049

FREEWHEEL DEVICES

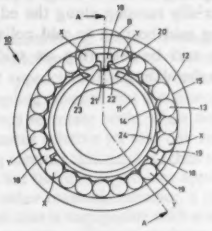
Kenneth Watson, Yeovil, and James Edwin Saunders, Sherborne, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Feb. 3, 1977, Ser. No. 765,119

Claims priority, application United Kingdom, Feb. 3, 1976, 4252/76

Int. Cl.[2] F16D *41/00*

U.S. Cl. 192—47 **16 Claims**



1. A cageless freewheel comprising a plurality of rollers interposed between inner and outer races formed respectively on a pair of driving and driven members, one of said races having wedge-shaped portions equal in number to the rollers, at least one axially extending actuating lever being interposed in the plurality of rollers and being arranged for limited circumferential movement between a first position in which the rollers assume an engaged position on rotation of the driving member so as to transmit rotation to the driven member, and a second position in which the rollers are retained in a disengaged position, and means for moving the or each lever between the said first and second positions.

4,093,050

CLUTCH AND ACCELERATOR CONTROLLED BRAKE LOCK FOR VEHICLES

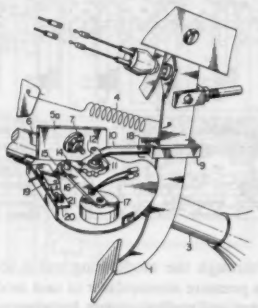
Akira Mizuno, Kariya, Japan, assignor to Goshi Kaisha Mizuno Kogeisha, Japan

Filed Mar. 24, 1976, Ser. No. 669,752

Claims priority, application Japan, Mar. 27, 1975, 50-37361

Int. Cl.[2] F16D *67/04*; B60T *11/10*

U.S. Cl. 192—0.049 **6 Claims**



1. A control device for a braking system of a vehicle comprising:

means for retaining a brake in braking condition and

electrical control means for said retaining means, said electrical control means including

means for energizing said retaining means upon stopping of the vehicle,

first switch means adapted to be actuated when an accelerator pedal is depressed beyond a predetermined extent,

second switch means adapted to be actuated when a clutch pedal is depressed to a predetermined position, and

circuit means for deenergizing said retaining means when both of said first and second switch means are actuated,

wherein said retaining means comprises ferromagnetic plate means provided stationarily, lever means pivotally mounted on said plate means and operationally connected to said brake pedal so that said lever means rotates in accordance with the movement of said brake pedal, and electromagnetic means mounted on said lever means so as to face said plate means so that when energized, said electromagnetic means is fixed on the plate means by magnetic attractive force.

4,093,051

HYDRAULIC CONTROL SYSTEM FOR POWER SHIFT TRANSMISSION

Ernest A. Kreitzberg, Mukwonago, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

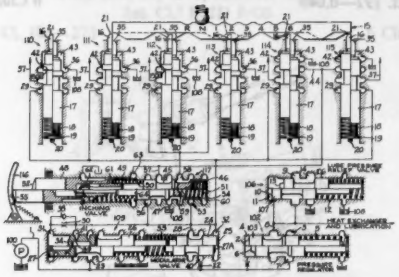
Filed Aug. 2, 1976, Ser. No. 710,908

Int. Cl.[2] B60K *29/02*

U.S. Cl. 192—87.13 **10 Claims**

1. A hydraulic system for a power shift transmission comprising, a source of pressurized fluid, a plurality of hydraulic actuators for actuating clutches in said power shift transmission, a pressure modulating valve connected to said source of pressurized fluid, conduit means connecting said modulating valve to each of said hydraulic actuators, a clutch valve connected between each of said hydraulic actuators and said modulator valve for selectively operating a mating of said hydraulic actuators, an inching valve connected to said source of pressurized fluid, means connecting said inching valve to at least two of said clutch valves for modulating pressure applied to said hydraulic actuators, means for selectively and alternatively operating and releasing each of said clutch valves, resilient means in each of said clutch valves for returning said

clutch valve to its return position, fluid throttling means in each of said clutch valves for regulating the rate of return of each of said clutch valves to its return position for controlling fluid flow from its mating hydraulic actuator and controlling the rate of pressure decay of pressurized fluid in the mating hydraulic actuator of the disengaged clutch, said modulating valve including a flow control valve with a piston for modulating the flow through the modulating valve to the actuated clutch valve, a pressure accumulator in said modulating valve having a plunger and resilient means between said piston and plunger operating said flow control valve in response to pressure build-up in said accumulator thereby throttling fluid flowing through said modulating valve and controlling the rate of pressure rise in said actuated clutch valve and mating hydraulic actuator of the engaged clutch.



4,093,052

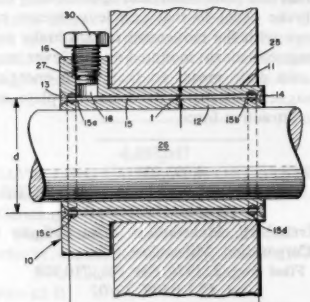
FLUID ACTUATED COUPLING ASSEMBLY

Curt Gunnar Falk, Sollentuna, Sweden, assignor to Forenade Fabriksverken, Sweden

Continuation-in-part of Ser. No. 435,728, Jan. 23, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,682

Int. Cl.² F16D *1/06*

U.S. Cl. 192—88 B **9 Claims**



1. A fluid actuated coupling assembly for releasably coupling at least two elements together preferably for transmitting torque therebetween comprising an outer metal sleeve, an inner metal sleeve concentrically mounted within the outer sleeve and secured thereto at least at one end and defining a recess or gap between the two sleeves which is closed at said one end of the sleeves, means for introducing a pressure fluid in said recess and means for preventing exhaust of said pressure fluid, said secured sleeves and said means for preventing exhaust of said pressure fluid defining a volume which includes said recess volume and which is slightly larger than said recess volume, the radial dimension of the sleeve walls of both sleeves being variable by changing the pressure on the pressure fluid on the said recess, the thickness of the recess in the non-pressurized state being determined by the following formula:

$$t/d = 2 \times 10^{-2}$$

where t equals the width of the recess and d equals the average diameter of the recess.

4,093,053

SLIDING COLLAR

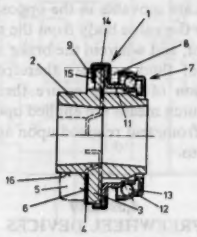
Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Mar. 30, 1977, Ser. No. 783,064

Claims priority, application Germany, Mar. 31, 1976, 7609872[U]

Int. Cl.² F16D *19/00, 13/60*

U.S. Cl. 192—98 **8 Claims**



1. In a sliding collar for a fork-activated coupling clutch release bearing, including a collar body with a cast-in wear-resistant disc formed on a radial flange of said collar, the improvement comprising a plurality of contact zones on said wear-resistant disc on the fork side of said disc for contacting said fork and on the bearing side of said disc for contacting the nonrotating bearing ring of the bearing, a plurality of guide zones essentially axially running along the edge of said disc, and means securing said bearing to said collar having guide zones for holding said bearing ring on said sliding collar against rotation on the sliding collar.

4,093,054

BELLEVILLE DAMPER FOR TORQUE TRANSMITTING COUPLING DEVICE

Marvin D. Johns, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

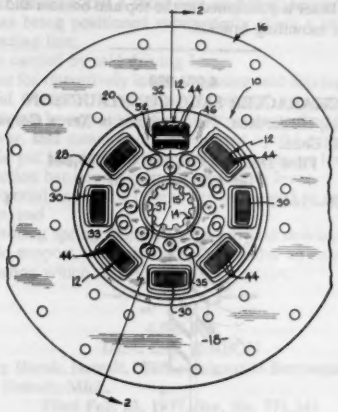
Filed Mar. 28, 1977, Ser. No. 781,813

Int. Cl.² F16D *3/14*

U.S. Cl. 192—106.1 **12 Claims**

1. In a coupling device, a rotatable hub assembly, a rotatable disc assembly rotatable relative to said hub assembly, aligned pockets in said hub and disc assembly having spaced side walls, resilient means in said aligned pockets adapted to establish a yieldable drive connection between said hub and disc assem-

bly, said resilient means comprising, a Belleville stack having end portions engaging said side walls in said aligned pockets,



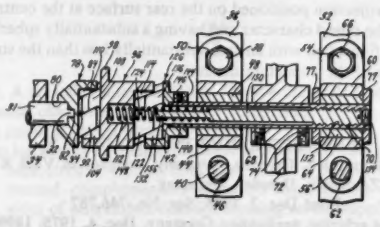
and guide means engaging said Belleville stack to retain the same in assembled relation within said aligned pockets.

4,093,055

TORQUE-TRANSMITTING, TORQUE SENSING SYSTEM

James R. Blackburn, and Dudley C. Smith, both of Dallas, Tex., assignors to John E. Mitchell Company, Dallas, Tex.

Filed Nov. 15, 1976, Ser. No. 742,002
Int. Cl.² F16D 67/00
U.S. Cl. 192—116.5 **18 Claims**



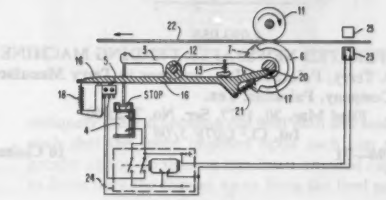
1. A torque-transmitting, torque-sensing control, which is usable to transmit torque between two rotatable members that are held against appreciable axial movement, and which comprises a first coupling element that is connectable to one of said rotatable members to rotate with, while not experiencing appreciable movement relative to, said one rotatable member, a second coupling element that rotates when said other rotatable member rotates but that can experience appreciable movement relative to said other rotatable member, a surface on said first coupling element that is engageable with a confronting surface on said second coupling element to force said coupling elements to rotate together while permitting appreciable relative movement between said coupling elements and also between said second coupling element and said other rotatable member, means urging said coupling elements for relative movement in one direction but yielding to permit relative movement of said coupling elements in the opposite direction, said means continuously holding said surfaces on said coupling elements in rotation-inducing engagement with each other, said surfaces on said coupling elements responding to a predetermined increase in rotation resistance of one of said coupling elements to cause relative movement of said coupling elements in said opposite direction, said means thereafter responding to a predetermined decrease in said rotation resistance of said one coupling element to cause relative movement of said coupling elements in said one direction, and a position sensor which senses said relative movement of said coupling elements.

4,093,056

SINGLE REVOLUTION MECHANISM

Gerrit Burgers, Amstelveen, Netherlands, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1976, Ser. No. 748,865
Claims priority, application Netherlands, Jun. 30, 1976, 7607249
Int. Cl.² F16D 71/00
U.S. Cl. 192—127 **6 Claims**



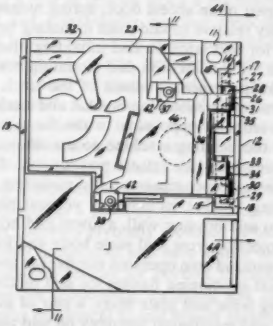
1. A single revolution mechanism, wherein a coupling between a shaft to be driven and a continuously rotating shaft is effected and latched, and after performing a predetermined rotation of the shaft to be driven, the latching and the coupling with said continuously rotating shaft are automatically interrupted, comprising: a feed roll (6) rotatably mounted at one end of a first lever (3); means (4) for bringing said first lever from the rest position to an operative position in which operative position said feed roll is in a proper position to be driven by frictional contact with a continuously rotating shaft (11); and, further means for mechanically latching said lever and feed roll in the operative position independently of said means (4) and means for eliminating this mechanical latching after a predetermined rotation of said feed roll.

4,093,057

GATE ASSEMBLY FOR A COIN SELECTING AND SEPARATING DEVICE

Kristen H. Dietz, Florissant, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Mar. 4, 1977, Ser. No. 774,252
Int. Cl.² G07F 1/00
U.S. Cl. 194—1 R **10 Claims**



1. A gate assembly for a coin selecting and separating device, comprising:

(a) a mainplate means,

(b) a first hinge socket means on the mainplate means,

(c) a first gate including:

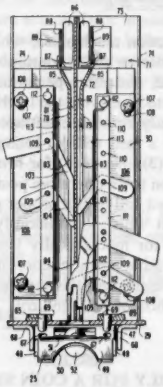
(1) a first pin inserted into the first hinge socket means,
(2) a second pin aligned but operatively disconnected from the first hinge socket means in an open position of the gate relative to the mainplate means, and
(3) key means for precluding angular movement of the first gate from the open position,
(d) a second hinge socket means on the first gate,
(e) a second gate including pin means disposed in the second hinge socket means, and
(f) the first and second gates being shiftable as a unit in the open position to operatively disengage the key means and to insert the second pin of the first gate into the first hinge socket means for hingedly connecting the first gate for angular movement of the gates to a closed position relative to the mainplate means.

4,093,058

COIN OPERATED NEWSPAPER VENDING MACHINE

Charles D. Terry, Palestine, Tex., assignor to Terry Manufacturing Company, Palestine, Tex.

Filed Mar. 30, 1977, Ser. No. 782,960
Int. Cl.[2] G07F 5/08
U.S. Cl. 194—71 **16 Claims**



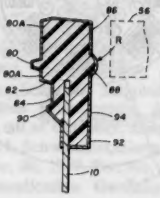
1. In a coin operated newspaper vending machine, a main mounting bracket adapted for attachment to the interior of a coin mechanism housing wall, a unitized coin operated mechanism assembly, positioning and supporting means for said assembly on said main mounting bracket, a vending machine access door latch, means to pivotally mount said latch on the interior of a part of an access door, spring means biasing said latch upwardly relative to said main mounting bracket, lateral guide means for said latch on said mounting bracket, positive keeper means for the latch on said mounting bracket engageable within keeper opening means of the latch, cooperative camming parts on the mounting bracket and latch forcing said latch downwardly in opposition to the force of said spring means when the vending machine access door is closed, the latch then being held in a release position out of engagement with the positive keeper means on said mounting bracket, said main mounting bracket including a vertical plate body for attachment to said housing wall, a lower end horizontal plate extension projecting from said plate body and forming a base seat for said unitized coin operated mechanism assembly, a pair of side vertical positioning flanges for said mechanism assembly projecting from said plate body, a pair of pivoted keeper elements for said mechanism assembly on said plate body near the top thereof and adapted to releasably engage over a web of said mechanism assembly to retain the assembly releasably against said plate body, said positive keeper means for said latch comprising a pair of spaced keeper pins depending from said horizontal plate extension for entry into a pair of spaced openings in said latch near opposite sides of the latch, and replaceable mounting plates for said keeper pins fixed to the top of said horizontal plate extension and forming a positive retainer means for the lower end of said mechanism assembly so that the latter is positioned at the top and bottom and at both sides of the mounting bracket.

4,093,059

CHARACTER SLUG CONSTRUCTION

Gordon Sohl, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1976, Ser. No. 747,844
Int. Cl.[2] B41J 1/30
U.S. Cl. 400—144.2 **4 Claims**



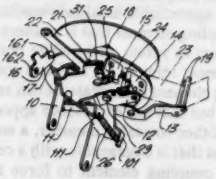
1. A character slug coupled to the end of a beam extending from the base of a print element for an impact printer, comprising:
a front surface having a raised character extending therefrom, and
a rear surface engageable by an impacting means for moving the slug in a print operation,
said rear surface including a projection extending therefrom to directly receive the strike from the impacting means and uniformly distribute impact forces therefrom over the character area,
said projection positioned on the rear surface at the centroid of the raised character and having a substantially spherical configuration with an area substantially less than the strike area of the impacting means.

4,093,060

TYPEWRITER RIBBON FEED DEVICE

Peter Muntschick, Dresden, Germany, assignor to VEB Kombinat Zentronik, Dresden, Germany

Filed Dec. 2, 1976, Ser. No. 746,787
Claims priority, application Germany, Dec. 4, 1975, 189879
Int. Cl.[2] B41J 33/14
U.S. Cl. 400—236.1 **3 Claims**



1. An ink ribbon feed device for a typewriter comprising:
a support, a toothed transport wheel mounted for rotation on said support about a first axis;
a ribbon spool carried by said support;
a transport lever pivotally mounted on said support for pivotal movement about a second axis;
a transport pawl rotatably carried by said transport lever;
a spring mounted between said transport pawl and said transport lever to urge said transport pawl into engagement with the toothed transport wheel;

a forked end on said transport lever remote from said transport pawl;

a driving lever pivotally mounted on said support for pivotal movement about a third axis, said first, second and third axes being positioned substantially along a straight connecting line;

a pin carried by said driving lever;

means for operatively interconnecting said driving lever and said transport lever whereby pivotal movement of said driving lever causes pivotal movement of said transport lever, said means being constituted by the engagement of said pin in said forked end of said transport lever;

a traction bar connected to said driving lever;

a universal bar of the typewriter connected to said traction bar; and

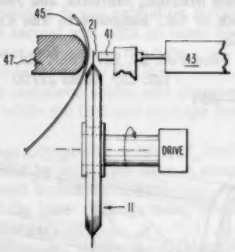
a restoring spring mounted between said driving lever and said support, wherein said pin includes an enlarged head portion which rests against said support.

4,093,061

DISC INK RIBBON

Anthony Horak, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 23, 1977, Ser. No. 771,341
Int. Cl.² B41J *31/14, 27/04*
U.S. Cl. 400—194 **5 Claims**



1. A rotatable integral ribbon disc for use with a dot matrix or solid character impact printer comprising:

a circular ribbon film;

an ink supply housing concentric at a reduced diameter with said circular ribbon film, said housing having first and second complementary members disposed on opposite sides of said ribbon film for forming an ink supply chamber fully enclosing a portion of said ribbon film; and

porous ink storage means within said ink supply chamber and surrounding said enclosed portion of the ribbon film for centrifugally replenishing the portion of the ribbon film outside of said housing with ink through said enclosed portion upon rotation of said ribbon disc.

4,093,062

METHOD OF AND APPARATUS FOR FEEDING ARTICLES

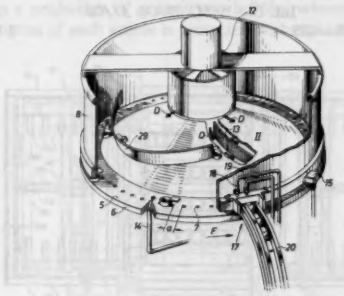
Börje Lennart Sjögren, Huddinge, Sweden, assignor to AB Wicanders Korkfabriker, Alvangen, Sweden

Filed May 3, 1976, Ser. No. 682,761
Claims priority, application Sweden, May 7, 1975, 7505342
Int. Cl.² B65G *47/24*
U.S. Cl. 198—380 **8 Claims**

1. Apparatus for orienting and entraining open ended closure caps having a flat top opposite the open end and which are randomly deposited on a work surface defining a peripheral feed path for conveying the caps one by one in top-down orientation to an ouput opening, the improvement comprising:

a deflector element overlying and spaced from a portion of the work surface so as to define a gap therebetween, means for injecting air between the deflector and the work surface to force air through the gap to tranverse the work surface laterally outwardly to carry the caps thereon outwardly toward the feed path, and

means surrounding the work surface for flowing air



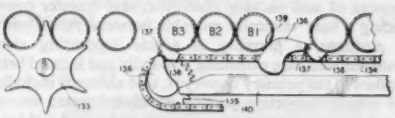
obliquely thereto between the feed path and said deflector such that the force imposed upon each cap thereby is greater on top-up than on top-down oriented caps thereby to force only the former away from the feed path.

4,093,063

ARTICLE HANDLING MEANS FOR A PACKAGING MACHINE

Rodney K. Calvert, Dunwoody, and Dale K. Scott, Jonesboro, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 650,805, Jan. 20, 1976, Pat. No. 4,023,328.
This application Mar. 17, 1977, Ser. No. 778,624
Int. Cl.² B65G *47/26*
U.S. Cl. 198—425 **2 Claims**



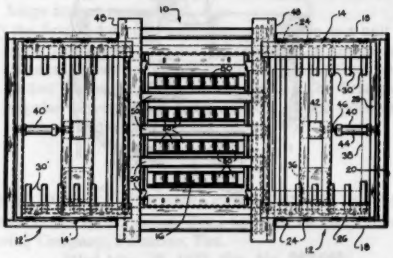
1. Article handling means for arranging continuously moving articles in spaced groups, said article handling means comprising conveyor means including metering means for continuously moving a row of articles along a predetermined path at a controlled and substantially constant velocity, an endless feed element having a working reach movable alongside said path, a plurality of article engaging pusher projections mounted in a spaced relation on said endless element and arranged respectively to move behind the rearmost article of a group of moving articles to impart movement to such group of articles in the direction of movement of the articles in such manner as to establish a gradually increasing space between such rearmost article and an immediately succeeding continuously moving article, a plurality of elongated smoothly contoured spacer elements pivotally mounted at one end thereof with said pusher projections and each spacer element having an article engaging restraining portion thereon, and spacer control means for sequentially engaging and imparting controlled swinging movement to said spacer elements relative to said endless feed element so as to swing the restraining portions thereof into the path of movement of the articles and into said spaces respectively only after the length thereof is sufficiently great to receive and portions thereby to grip a group of articles between each of said restraining portions and each of the immediately succeeding pusher projections respectively.

4,093,064

CONVEYOR PACKING STATION

Robert H. Crane, Union Lake, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Nov. 17, 1976, Ser. No. 742,618
Int. Cl.[2] B65G 25/04, 37/00
U.S. Cl. 198—485 1 Claim



1. A conveyor packing station for use with a primary conveyor having a longitudinal length defined by lateral side rails and a plurality of transversely disposed, spaced, parallel rollers defining a primary conveyor plane, comprising, in combination, a packing station frame disposed adjacent a primary conveyor side rail, a packing conveyor movably mounted on said packing station frame above said primary conveyor plane for movement between an extended position positioning an end of said packing conveyor adjacent and over the primary conveyor and plane thereof and a retracted position away from the primary conveyor, a plurality of rollers rotatably mounted upon said packing conveyor defining a support surface for an article to be packed, said rollers being substantially parallel to the length of the primary conveyor, motor means mounted on said packing station frame operatively connected to said packing conveyor for moving said packing conveyor between said extended and retracted positions, a transfer conveyor disposed below the primary conveyor in alignment with the direction of movement of said packing conveyor, said transfer conveyor including a base vertically movable between raised and lowered positions, a plurality of article supporting elements mounted on said base extending upwardly and located between the rollers of the primary conveyor, said elements including an upper article supporting portion which is located above and below the primary conveyor rollers at said raised and lowered positions of said transfer conveyor, respectively, said packing conveyor at said extended position being disposed adjacent said transfer conveyor at said raised position thereof, and second motor means operatively connected to said base for selectively translating said base between its raised and lowered positions, and third motor means mounted on said packing conveyor drivingly connected to at least some of said rollers thereof to move an article supported thereon toward the primary conveyor upon energizing of said third motor means.

4,093,065

MACHINE FRAME ASSEMBLIES FOR SCRAPER-CHAIN CONVEYORS

Helmut Temme, Waltrop, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Germany

Filed Jun 1, 1976, Ser. No. 691,236
Claims priority, application Germany, Jun 6, 1975, 2525343
Int. Cl.[2] B65G 19/28
U.S. Cl. 198—735 10 Claims

1. In a machine assembly for a scraper-chain conveyor which has a frame composed of side walls and means for driving a scraper-chain assembly mounted between the side walls; the improvement comprising first uppermost and second lowermost inclined plates disposed one above another between the side walls, each plate having an upper surface which can form part of a conveying surface leading to said drive means, the uppermost plate being detachable to permit the lowermost plate to become operative as part of the conveying surface in dependence on the size of the drive means and the scraper-chain assembly, wherein an intermediate channel structure is disposed between the frame and a further channel structure, said further channel structure having side walls and an inclined plate between the side walls which aligns with the lowermost

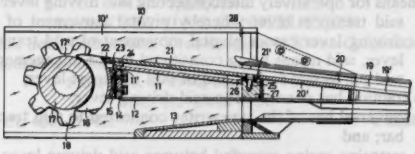


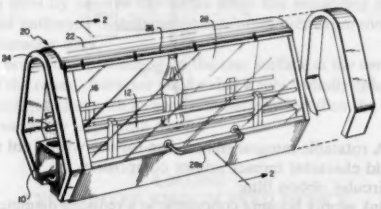
plate of the frame, said intermediate channel structure having side walls and an inclined plate between the side walls which aligns with the uppermost plate of the frame, and wherein the removal of the uppermost plate in converting the assembly for use with a smaller drive means is accompanied by the removal of the intermediate structure and the connection of the frame with the further structure.

4,093,066

ACOUSTICAL CONVEYOR COVER

Charles Ronald Mitchell, Marietta, and Jason K. Sedam, Dunwoody, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 28, 1977, Ser. No. 772,900
Int. Cl.[2] B65G 21/00
U.S. Cl. 198—861 2 Claims



1. In combination with a conveyor, which transports articles between an article washing station and an article filling station, the improvement comprising:

a conveyor cover including a top portion, the inside surface of said top portion forming a substantially continuous curve with the inside surfaces of a pair of sidewalls which extend downwardly from said top portion to a support structure for said conveyor;

means for attenuating noise internally generated within said cover including acoustically absorbent material, said material being a compressible resilient material;

door means connected in an opening in said conveyor cover for providing access to said conveyor, said door having a transparent portion to facilitate viewing of said articles on said conveyor within said cover;

drain means provided between said support structure for the conveyor and the lower portion of said sidewalls for permitting drainage of any moisture within said cover; and

means for releasably retaining said acoustically absorbent material including a pair of retaining clips mounted on the inside surface of a sidewall of said cover opposite to said door means, said retaining clips of said pair being so spaced as to retain said acoustically absorbent material therebetween in a compressed state, whereby said acoustically absorbent material conforms to the shape of the

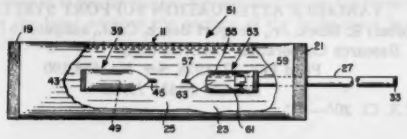
adjacent sidewall and holds itself between said clips with a self-biasing action.

4,093,067

MIXING PACKAGE

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

Filed Nov. 8, 1976, Ser. No. 739,476
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 6 Claims



1. A package comprising
a tube of flexible material having a first and second end,
a first seal extending transversely across the tube and closing said first end,
a second seal extending transversely across the tube and closing said second end,
a chamber formed by said tube and said end seals for containing contents,
hollow stem dispensing means extending through and supported by said second seal with an inner end inside the tube and an outer end outside the tube,
means closing the outer end of the stem,
a second package contained within said chamber to form an inner package while the first-said package forms an outer package,
said inner package comprising a tube of flexible material closed at its ends by seals that form a second chamber containing second contents,
with the seals of the inner package being weaker than the seals of the outer package,
a third package contained within the first-said chamber,
said third package comprising a tube of flexible material closed at its ends with seals that form a third chamber containing third contents,
with the seals of the third package being stronger than the seals of the second package,
with the inner end of said stem extending into the chamber of the third package,
the contents of the first and second packages forming a temperature-changing reaction when mixed together,
whereby the outer package may be squeezed to rupture a seal of the second package and mix its contents with the contents of the outer package to form a reaction which changes the temperature of the contents of the third package,
and whereby the stem closing means may be opened and the outer package may be squeezed to dispense the temperature-changed contents of the third package.

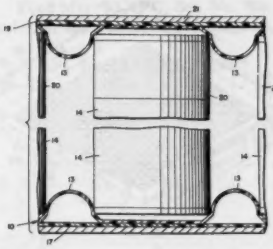
4,093,068

PACKING SHEET AND PACKAGES FORMED THEREBY

Thomas J. Smrt, Bartlett, Ill., assignor to Fox Valley Marking Systems, Inc., Cary, Ill.

Filed Sep. 13, 1976, Ser. No. 722,703
Int. Cl.[2] B65D *81/02*
U.S. Cl. 206—443 3 Claims

1. A package comprising a plurality of elongated articles, each article having a top and a bottom, a bottom cushioning sheet supporting the bottoms of the articles, a top cushioning sheet positioned over the tops of the articles, and a carton enclosing the cushioning sheets and the articles, each of the top and bottom cushioning sheets including a plastic sheet having air-tight air-filled compressible bubbles formed therein contacting the articles, each bubble comprising radially outwardly extending projections and being generally positioned in a space between adjacent articles, the spacing between adjacent bubbles of a sheet being less than the width of the articles so that the top and bottom of each article contacts and partially compresses a projection of at least two bubbles whereby the top and bottom of each article is protected within the carton by a



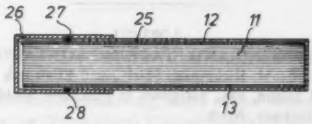
cushion of air within the bubbles, the compressing of said projections by the articles causing the height of the bubbles between adjacent articles to be greater than the height of the bubbles before the articles contact the bubbles and the pressure of the air within the bubbles to be greater than the pressure of the air within the bubbles before the articles contact the bubbles.

4,093,069

PACKAGE FOR A STACK OF SHEET MATERIALS

Albert Emiel Smolderen, Aartselaar, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 530,028, Dec. 4, 1974, abandoned. This application Apr. 6, 1976, Ser. No. 674,150
Claims priority, application United Kingdom, Dec. 7, 1973, 56848/73
Int. Cl.[2] B65D *65/16, 75/28*
U.S. Cl. 206—455 2 Claims



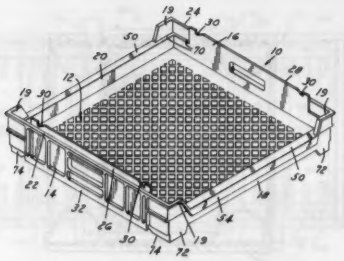
1. A package for a stack of generally quadrangular sheet materials whic is adapted to be opened at one end to leave a defined edge around said opening, which package comprises a composite wrapper of flexible wrapping material having a width slightly exceeding the width plus twice the thickness of said stack and an overall length exceeding twice the length and twice the thickness of said stack, said wrapper including at least one body sheet extending around one end and the major lengthwise portion of the opposite exterior surfaces of said stack but terminating at both end edges short of the other stack end, at least one end sheet extending around said other stack end and over the remaining lengthwise portions of said exterior surfaces with its edge margins in overlapping relation with the edge margins of said body sheet, a seal detachably adhering each end of said body sheet in the vicinity of the edge threof to a locus of the contiguous face of the end sheet spaced from the corresponding end edge of said end sheet, said composite wrapper being uniformly tensioned around the stack periphery in its lengthwise direction, whereby said stack is tightly contained within a tube defined by the thus sealed composite wrapper, and means for sealing the opposite ends of said tube along the sides of said stack.

4,093,070

STACKING AND NESTING CONTAINER

Edward L. Stahl, Richmond, Mich., assignor to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed Mar. 9, 1977, Ser. No. 775,727
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 12 Claims



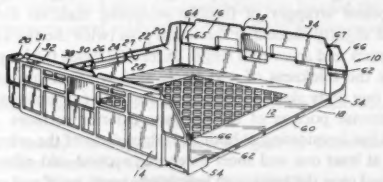
1. An upwardly open container having a rectangular bottom wall, side walls extending upwardly from opposite side edges of said bottom wall, said side walls having stacking supports adjacent the upper edge portions thereof, said container having on opposite sides thereof first rests directly under said supports so that said container can be stacked at an upper level with respect to another similarly or reversely oriented container of identical construction by engaging the first rests of the upper container with the stacking supports of the lower container, end walls extending upwardly from the front and rear edges of said bottom wall, said end walls throughout at least a major portion of their length being of less height than said side walls and having second rests disposed below the level of said stacking supports and above the level of said first rests, said second rests being spaced apart the same distance as said stacking supports so that said container can be nested at a lower level with a 90° turned lower container of identical construction by engaging the second rests of the end walls of the upper container with the stacking supports of the side walls of the lower container.

4,093,071

NESTING AND STACKING CONTAINER

Edward L. Stahl, Richmond, Mich., and Ellsworth E. Sanders, Sanibel Island, Fla., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed Apr. 4, 1977, Ser. No. 784,145
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 8 Claims



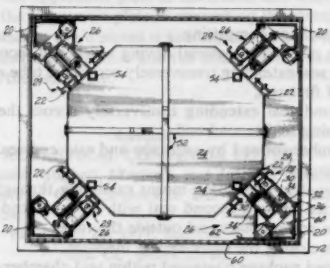
1. An upwardly open container comprising a substantially square horizontal bottom wall, side walls extending upwardly from opposite side edges of said bottom wall, first seating means adjacent the upper edge portion of one of said side walls, second seating means on the other of said side walls, a horizontal nesting support member extending across the rear of said container, rest means at the front of said container, said container being adapted to nest with a 90° turned lower container of identical construction by engaging said support member of the upper container with said first seating means of the lower container and engaging said rest means of the upper container with said second seating means of the lower container, said support member being disposed at a level above said bottom wall and below said first seating means, said second seating means being disposed at a level below said first seating means in a position to maintain the bottom wall of an upper nested container parallel with the bottom wall of the lower container.

4,093,072

VARIABLE ATTENUATION SUPPORT SYSTEM

Robert R. Black, Jr., Newport Beach, Calif., assignor to Plastics Research Corporation, Cerritos, Calif.

Filed Feb. 17, 1976, Ser. No. 658,190
Int. Cl.[2] F16M *13/00*
U.S. Cl. 206—521 11 Claims



1. A variable attenuation support system for a payload comprising:

a base support;

a payload support separated from the base support;

a plurality of mounting pads affixed to said base support;

a plurality of mounting pads affixed to said payload support, a plurality of pairs of said pads being formed in which one pad of said pair is on said base support and one on said payload support; and

an adjustable shock mount for each said pair of pads, each adjustable shock mount comprising a plurality of resilient shock absorbers, means for connecting a first one of said shock absorbers between the corresponding pair of pads, and means for locking and unlocking at least a second one of said shock absorbers between the corresponding pair of pads, said locking and unlocking means comprising means for pivotally mounting one end of the corresponding shock absorber to one of the pads in the corresponding pair of pads and a manually operable lock for locking and unlocking the other end of the same shock absorber to the other pad in the corresponding pair of pads.

4,093,073

FIBER CAN DOUGH PACKAGE WITH KRAFT PAPER BODY AND PEELABLE LABEL

James R. Leezer, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

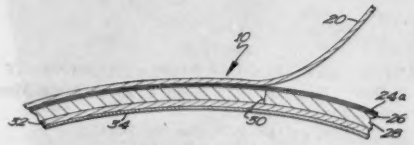
Continuation-in-part of Ser. No. 561,132, Mar. 24, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,913
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—606 7 Claims

1. A fresh dough package comprising:

(a) a generally cylindrical can having a cylindrical body wall comprising a kraft paper body stock layer in strip form wound into a helix with its mating side edges defining a helically extending butt joint,

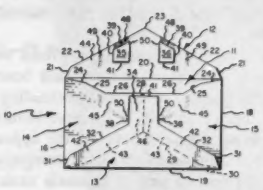
(b) a liner formed from flexible sheet material against the inside surface of the body stock layer and overlapping the inner edge of the butt joint in the body stock layer,

(c) a removable label layer peelably bonded to the outside surface of the kraft body stock layer,
(d) said label layer having means therein defining a lifting tab, said lifting tab providing a means for withdrawing the label from the surface of the kraft body stock layer,
(e) a peelable particulate mineral coating layer bonded between the label and the kraft body stock layer,
(f) the removal of the label causing at least a portion of the particulate mineral layer to peel away from the adjacent body stock layer and at least a portion thereof to remain adhered to the label layer thereby facilitating the removal of the label without the surface of the body stock layer adhering to the label,



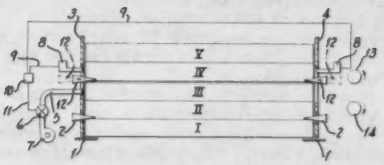
(g) the peel strength of the bond between the label and the kraft body layer being between about 0.1 and 0.5 pounds per inch width of the label and also being less than the tensile strength of the label, thereby allowing removal of the label intact at least from the area of the butt joint to weaken the butt joint by an amount which is uniform throughout its length whereby the butt joint will have uniform opening characteristics throughout its length to facilitate opening the container at the butt joint, and
(h) a circular end closure member sealed to at least one end of the tubular body wall of the container.

4,093,074
ENVELOPES
William E. Bielawski, 19 James Pl., Fredonia, N.Y. 14063
Filed Jun. 24, 1977, Ser. No. 809,631
Int. Cl.² B65D *27/34*
U.S. Cl. 206—629 **5 Claims**



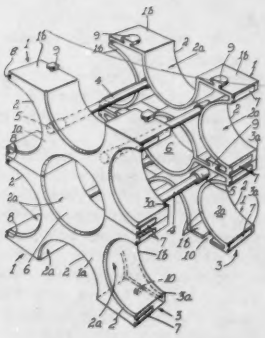
1. An envelope having a front panel, a bottom flap, a top flap, and two side flaps, and wherein said bottom flap is folded to have first marginal portions thereof overlap first marginal portions of said side flaps and is glued to said side flap first marginal portions to form a back panel, and wherein said top flap may be selectively folded to have first marginal portions thereof overlap second marginal portions of said side flaps, the improvement which comprises:
an improved bottom flap adapted to reinforce said back panel and adapted to facilitate opening of said envelope, said improved bottom flap including a substantially T-shaped portion having a leg and two wings extending laterally from said leg in opposite directions, said leg being glued to third marginal portions of said side flaps with said wings being unattached to said side flaps; and
spaced glue portions provided on said top flap first marginal portions and adapted to adhere to said wings but not said leg;
whereby said envelope may be opened by grasping such unglued portion of said top flap overlapping said leg and pulling the same to tear said wings from said leg.

4,093,075
EJECTION DEVICES
Desmond Walter Molins, London, England, assignor to Molins Limited, London, England
Filed Mar. 22, 1977, Ser. No. 780,131
Claims priority, application United Kingdom, Mar. 27, 1976, 12410/76
Int. Cl.² B07C *5/344*
U.S. Cl. 209—73 **6 Claims**



1. An ejection mechanism for cigarettes or like articles for association with means defining a vertical channel through which cigarettes may be stacked one above the other and descend intermittently, comprising a pair of support members at a support level higher than the bottom of said channel, said support members being arranged so as to support end portions of a cigarette in said channel and being movable out of said channel to allow said cigarette to fall below said support level, sensing means at a sensing level above said support level, an air nozzle disposed at a level below said support level to produce a horizontally-directed air-blast against one end of a cigarette to displace such cigarette from the channel, and a valve arranged to control air supply to said nozzle, said sensing means being connected to control said valve so that said valve is opened to allow said air-blast to operate when the cigarette at the level of the nozzle has a bad end detected by the sensing means.

4,093,076
BOTTLE RACKS, PARTICULARLY RACKS FOR WINE BOTTLES
Brian R. Newton, Johannesburg, South Africa, assignor to Newton & Taylor (Proprietary) Limited, South Africa
Filed Jan. 16, 1975, Ser. No. 541,503
Claims priority, application South Africa, Jan. 22, 1974, 74/0450; Sep. 4, 1974, 74/5616
Int. Cl.² A47B *73/00*
U.S. Cl. 211—74 **9 Claims**



1. A rack for bottles, or the like, comprising:

a plurality of basic rack forming elements arranged in two spaced apart substantially coplanar sets; each of said basic elements having a periphery defined by edges; at least one concave formation defined in a said edge, thereby to define at least part of a supporting surface for a bottle, or the like;

said basic elements of said sets thereof are oriented and positioned such that each concave formation defined in the basic elements making up one of said sets is generally aligned with a concave formation defined in the basic elements making up the other of said sets, thereby to provide and define at least part of two cooperating supporting surfaces for support of a bottle, or the like, that extends between two aligned said formations on the two said sets;

means for joining said sets of basic elements and for supporting them in their said orientations;

the edges of the outermost basic elements of each set defining the free edge portions of the sets said free edge portions being aligned;

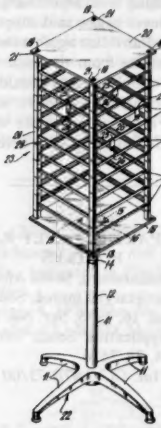
a terminal rack forming element extending between said sets at a free edge portion thereof; said terminal element being in engagement with a said aligned free edge portion of both said sets; thereby closing off said free edge portion of both said sets and to close off the space between said sets.

4,093,077

JEWELRY DISPLAY RACK

Thomas Strasser, 1500 Palisades Ave., Apt. 24B, Fort Lee, N.J. 07024

Filed Apr. 15, 1977, Ser. No. 787,868
Int. Cl.² A47F 7/02
U.S. Cl. 211—194 **3 Claims**



1. A novel jewelry rack providing a variable capacity storage and ease of assembly comprising:

a base for supporting the jewelry rack in the display area;

said base having a plurality of mounting rods extending generally upwardly from and attached to said base to support said jewelry rack;

a plurality of vertically stacked modular display frames adapted for display of jewelry and supported by said mounting rods; each of said modular display frames having a plurality of corner posts and jewelry mounting frame members connecting said corner posts, each of said corner posts having a substantially vertical channel each adapted to receive one of said mounting rods, so that said modular display frames are supported in a vertical stack of variable capacity upon which jewelry is displayed

and wherein the bottom of each corner post is substantially horizontal and has a recessed area, the top of each of said corner post being substantially horizontal, having an upwardly projecting area conforming with the upper adjacent recessed area in the bottom of the corner post of the modular display frame stacked above so as to provide for easier assembly of the jewelry rack by improving the stability of the vertical stack of modular display frames

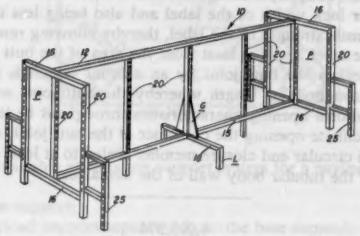
and wherein said jewelry mounting frame member is a straight beam having a substantially vertically disposed L-shaped cross section, the horizontal protion of said L-shaped cross section being directed toward the interior of said modular display frame so as to form an interior lip on said beam to facilitate attachment of jewelry mounting means to said jewelry mounting frame member.

4,093,078

TANDEM MERCHANDISE DISPLAY EQUIPMENT

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Filed Jul. 15, 1976, Ser. No. 701,071
Int. Cl.² A47F 5/10
U.S. Cl. 211—189 **5 Claims**



1. A knockdown frame for supporting merchandise display and housing equipment, comprising

(a) a pair of laterally spaced transverse beams of channel cross-section on the same level adjacent the lower end of the frame, with the flanges of said channels extending downwardly,

(b) a vertical strut of channel form affixed to the downwardly facing flanges of each of said beams with the flanges of the channel of said strut extending outwardly,

(c) a second pair of laterally transverse beams of channel cross-section on the same level at the upper end of the frame and overlying said first pair of transverse beams, the flanges of the second pair of channels extending downwardly,

(d) means for joining the upper end of said vertical strut to the downwardly facing flanges of said second pair of beams,

(e) a channeled lug welded to the lower end of each strut and projecting in a longitudinal direction from each of said first-mentioned downwardly facing flanges, with the web of the lug uppermost and its inner portion having a rectangular recess adapted to embrace said strut, and the inner edges of said web welded to the respective flanges of said first-mentioned transverse beams, and

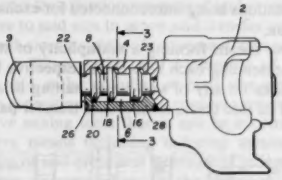
(f) a longitudinal beam of channel cross-section with the flanges extending downwardly between said channeled lugs and with the ends thereof disposed in superposed relation to said lugs and having a rectangular recess in the outer ends for embracing each vertical strut as well as openings in proximity thereto in alignment with corresponding openings in the webs of the lugs for receiving detachable interconnecting fastening means therebetween.

4,093,079

ROTARY COUPLER

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 18, 1977, Ser. No. 778,901
Int. Cl.[2] B61G *1/38*
U.S. Cl. 213—62 A 7 Claims



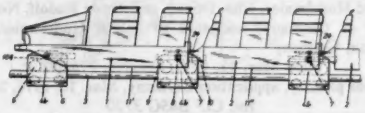
1. A rotary coupler for a railway car comprising a coupler head having a shank extending rearwardly therefrom, said shank having an opening therein with a plurality of bearing surfaces, a coupler butt contiguous with the end of the shank, said butt having a forwardly extending cylindrical member attached thereto which extends into the opening in the shank wherein the cylindrical member may rotate within said shank and a plurality of spaced bosses on said cylindrical member cooperating with the bearing surfaces for sustaining draft and buff forces.

4,093,080

VEHICULAR TRAIN

Anton Schwarzkopf, Munsterhausen, Germany, assignor to Anton Schwarzkopf, Stahl- und Fahrzeugbau, Munsterhausen, Germany

Filed Feb. 25, 1977, Ser. No. 772,265
Claims priority, application Germany, Mar. 1, 1976, 2608424
Int. Cl.[2] B61G *1/00*
U.S. Cl. 213—75 R 14 Claims



10. In a vehicular train including a lead vehicle and a follower vehicle hitched to said lead vehicle by a universal coupling, each of said vehicles being provided with a wheeled body, the improvement wherein said coupling comprises:

a pair of wheel mountings pivoted to the body of said lead vehicle on opposite sides thereof for swinging about a common axis transverse to the direction of vehicular motion;

a bolt centered on said axis interconnecting said wheel mountings with freedom of relative rotation about said axis; and

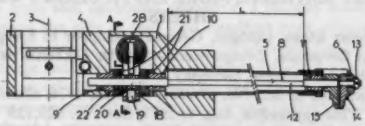
a pair of generally horizontal arms rigid with the bodies of said vehicles extending in said direction, one of said arms terminating in an annular inner knuckle traversed by said bolt and provided with a spherically curved outer surface, the other of said arms terminating in an outer knuckle with a spherically curved inner surface surrounding said inner knuckle.

4,093,081

TRANSFER ARM FOR TRANSFERRING SMALL OR MEDIUM SIZED PARTS

Jacques Yver, Grenoble, France, assignor to Metallurgie Francaise des Poudres-Metafram, Paris, France

Filed Jan. 17, 1977, Ser. No. 759,743
Claims priority, application France, Feb. 27, 1976, 76 05588
Int. Cl.[2] B66C *1/54*
U.S. Cl. 214—1 BB 5 Claims



1. A low inertia transfer arm for rapid operation and for manipulation of small or medium sized parts, said transfer arm comprising:

a supporting arm adapted for connection at one end to a device for movement of said arm having at least two degrees of freedom;

a pair of tongs comprising a pair of jaws for gripping a part;

means mounting said tongs at the other end of said supporting arm, one of said jaws being rigidly attached to said supporting arm and the other of said jaws being movable relative thereto between open and closed relative positions of said jaws; and

means for controlling opening and closing of said jaws, said controlling means including;

a rocker lever comprising a pair of arms;

means mounting said rocker lever for movement between two stable positions, said rocker lever being arranged to be movable between said stable positions by contact between a respective one of said arms and a fixed stop;

a torsion bar extending along said support arm fixed at one end to said movable tong jaw and at the other end to said rocker lever for rotation therewith about its longitudinal axis to cause opening an closing of said jaws; and

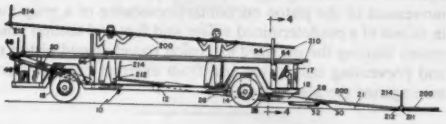
means mounting said torsion bar for rotation about its axis in said supporting arm.

4,093,082

IRRIGATION PIPE LAYING AND PICK UP VEHICLE

Melton Archie Goodsell, 2325 Olive Rd., Holtville, Calif. 92250

Filed Jul. 30, 1976, Ser. No. 710,191
Int. Cl.[2] A01G *25/02*; F16L *1/00*
U.S. Cl. 214—1 PA 19 Claims



1. A vehicle for picking up and laying irrigation pipe of the type consisting of a plurality of rigid sections and couplings between the sections forming a line of pipe, said vehicle comprising:

a vehicular frame having a raised platform,

inclined guide means mounted on said frame at a first end of said vehicle for guiding the end of a section of irrigation pipe being picked up from the ground level to above the level of said platform as said vehicle is operated toward said line of pipe and for guiding the pipe section down said guide means as said vehicle is operated away from said line of pipe,

rack means adjacent said platform for supporting a plurality of said sections of irrigation pipe in stacked relationship,

uncoupling means for uncoupling a section of said pipe being picked up from the subsequent pipe section,

said uncoupling means comprising angulation guide means for guiding the free end of the leading pipe section and elevating said end relative to the longitudinal axis of the adjacent section.

4,093,083

APPARATUS FOR STACKING AND UNSTACKING SHEET MATERIAL, MORE PARTICULARLY GLASS SHEETS

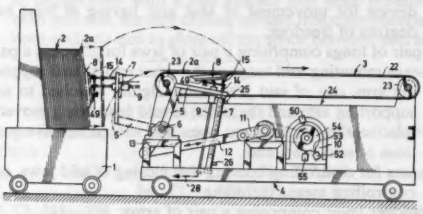
Karl-Heinz Klaus, Cologne, Germany, assignor to Spiegelglaswerke Germania, Zweigniederlassung der Glaceries de Saint-.Roch S.A., Cologne, Germany

Continuation of Ser. No. 676,334, Apr. 12, 1976, abandoned. This application Aug. 9, 1977, Ser. No. 823,125

Claims priority, application Germany, Apr. 17, 1975, 2516884; Mar. 29, 1976, 2613322

Int. Cl.[2] B65G *57/28*

U.S. Cl. 214—7 **6 Claims**



1. In an apparatus for adding to and removing glass sheets from a stack of glass sheets arranged in vertically inclined position, one upon another, the apparatus having a pivotally mounted arm with a free end, means for reciprocating said arm between advanced and retracted positions, a pneumatic cylinder mounted on said arm adjacent said free end and having a telescoping piston rod and a vacuum plate mounted on said rod, means for supplying air under pressure to said cylinder to thereby shift said piston rod and means for evacuating said vacuum plate, means for accommodating variations in spacing between the face of the stack of sheets and the limit of travel of said arm toward the face of said stack, the spacing between said arm and the face of said stack changing from sheet to sheet; said accommodating means including a first pressure sensitive sensor means communicating with said vacuum plate for reading the magnitude of the vacuum established therein when said vacuum plate engages a sheet; a second pressure sensitive sensor means communicating with said pneumatic cylinder for reading the change in pressure when forward movement of the piston encounters resistance of a magnitude in excess of a predetermined value; said first and second sensor means limiting the outward extension travel of said piston rod and preventing said piston rod from exerting excessive pressure against the glass sheets.

4,093,084

FREIGHT-TRANSPORTATION SYSTEM WITH ROAD/RAIL TRANSSHIPMENT

Karl Ringer, Frauenbergstrasse 30, Bad Waldsee, Germany (D-7967)

Filed Aug. 25, 1975, Ser. No. 607,509

Claims priority, application Germany, Aug. 24, 1974, 2440682

Int. Cl.[2] B65G *43/00*

U.S. Cl. 214—11 R **26 Claims**

1. A freight-transportation system serving a given territory, comprising:

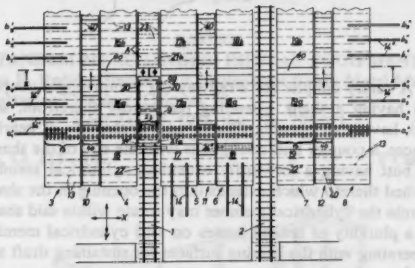
a rail network having a multiplicity of transfer stations each forming a junction between at least one railroad track and a local road;

loading and unloading bays at said stations accommodating road vehicles adapted to carry modular loads of predetermined dimensions;

conveyor means at each of said stations for transferring loads between said bays and respective spaces on flatcars of trains halting at said stations; and

a computer at each of said stations controlling the operation of said conveyor means thereof in response to destination and available-space information fed in, the computers of adjacent stations being interconnected for exchanging said information;

said conveyor means forming a multiplicity of straight-line transfer paths extending each between a respective bay and an assigned unit area on any of said trains halting in a predetermined position on said track, each of said transfer paths includ-



ing a set of rollers arrayed in at least one row transverse to said track and drive means controlled by said computer for displacing said rollers to advance a load resting thereon, said track being disposed in a well flanked by at least two raised platforms in line with load-carrying surfaces of said flatcars, said platforms being each traversed by a multiplicity of said transfer paths, said flatcars being provided with rows of further rollers forming extensions of said transfer paths in said predetermined position, the platforms proximal to said track being longitudinally divided into sections each substantially coextensive in length with a flatcar of any of said trains, each of said sections being individually transversely shiftable toward an aligned stationary flatcar of any of said trains and being further shiftable across said well in the absence of a train on said track.

4,093,085

APPARATUS FOR MAKING READY-MIXED CONCRETE

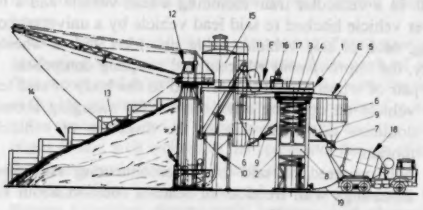
Gerhard Hudelmaier, Ulm, Donau, and Anton Rudolf, Neu-Ulm, both of Germany, assignors to Ingrid Hudelmaier, Ulm, Donau, Germany

Filed Mar. 11, 1977, Ser. No. 776,585

Claims priority, application Germany, Mar. 16, 1976, 2611055

Int. Cl.[2] B65G *3/20*

U.S. Cl. 214—16 R **9 Claims**



1. Apparatus for delivering batches of ready-mixed concrete materials from a bunker to concrete mixer trucks comprising:

a carrier structure including a central tower having a vertical axis and an elevated cross arm structure,

said cross arm structure including a plurality of arms extending radially outwardly from said axis of said central tower

and angularly spaced apart from each other and said axis at regular angular intervals;

a plurality of transfer containers, at least one transfer container mounted on each of said arms, each transfer container comprising a plurality of separate material storage compartments therein and each container having a closeable outlet at the bottom thereof;

actuating means on said apparatus for operating said outlets;

drive means for effecting rotation of said cross arm structure relative to said axis to move said transfer containers along a closed circular path of movement around said axis between a filling station and a plurality of other stations along said path, including at least one emptying station above a position whereat a concrete mixer truck having positive mixing tools therein can be accommodated,

said drive means including indexing means for effecting rotation of said cross arm structure in indexed incremental amounts corresponding to the distance between each adjacent pair of stations;

conveyor means located clear of said circular path of movement of said transfer container and clear of said cross arm structure for conveying material from said bunker to a position above said filling station for delivery to a transfer container thereat;

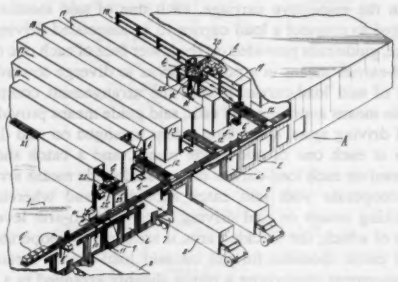
and an operator's control station including operator-actuated controls connected for operating said conveyor and said drive means.

4,093,086

WAREHOUSING SYSTEM

Lester Wade Lucas, and William Marion Albers, both of St. Louis County, Mo., assignors to Wetterau Incorporated, St. Louis, Mo.

Filed Feb. 9, 1976, Ser. No. 656,315
Int. Cl.² B65G *47/00*
U.S. Cl. 214—16.4 A **7 Claims**



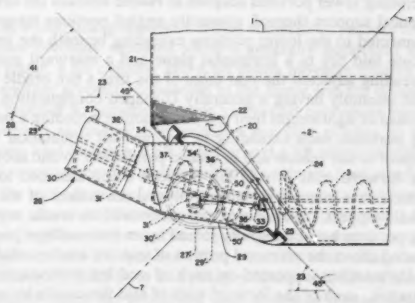
1. A merchandise warehousing arrangement comprising a support surface, a plurality of rows of a multiplicity of storage racks in aligned side by side relationship, adjacent ones of said rows being parallel and spaced apart a distance sufficient to define therebetween an access aisle, a plurality of loading vehicles adapted to move therein, a merchandise outbound conveyor elevated above said support surface and having its path of travel in axially perpendicular relationship to the longitudinal axis of the storage racks rows, conveyor spurs elevated above said support surface connecting the proximate ends of preselected access aisles and said outbound conveyor, a first inbound conveyor elevated above said support surface and having its direction of travel in axially parallel relationship to the longitudinal axis of said rows of storage racks, said first inbound conveyor presented along the length of and parallel to at least one of said rows of storage racks and extending substantially between first and second load handling zones, said load handling zones being at opposite ends of said rows of storage racks, said first and second load handling zones respectively providing first and second vehicle loading docks each having a respective boundary spaced from the ends of said rows of storage racks and extending in perpendicular relationship to the longitudinal axis of said rows of storage racks, a second merchandise inbound conveyor elevated above said support surface and overlying a portion of said second load handling zone, said second merchandise inbound conveyor being positioned above said second loading dock and adjacent said second loading dock boundary and having its travel path along said boundary in axially perpendicular relationship to the longitudinal axis of said rows of storage racks and disposed in spaced apart relationship to the ends of said storage rack rows remote from said outbound conveyor, a railway siding presented upon the side of said load handling zone remote from said storage racks and in axially perpendicular relationship to said storage racks, said second inbound conveyor means presented in overlying relationship to the portion of said load handling zone immediately proximate said railway siding, said first inbound conveyor being spaced at its ends from said outbound conveyor and said second inbound conveyor, said merchandise outbound conveyor being positioned above said first loading dock and adjacent said loading dock boundary and having its travel path along the last said boundary, said merchandise outbound conveyor overlying a portion of said first load handling zone, said first and second inbound conveyors permitting inbound merchandise handling at both said first and second load handling zones without interference with outbound merchandise handling at said first load handling zone, the extent of elevation of said merchandise outbound conveyor, said conveyor spurs and said first and second inbound conveyors being sufficient to permit movement of fork trucks or other mobile loading units therebeneath and to allow of facile load handling therebeneath by personnel with respect to vehicles adjacent each of said first and second loading dock boundaries.

4,093,087

UNLOADING TUBE ARRANGEMENT FOR COMBINE HARVESTER GRAIN TANK

Frans J. G. C. DeCoene, Zedelgem, Belgium, assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 27, 1977, Ser. No. 810,546
Claims priority, application United Kingdom, Jun. 29, 1976, 26947/76
Int. Cl.² B60P *1/42*
U.S. Cl. 214—83.26 **15 Claims**



1. A combine harvester comprising:

a grain tank with a discharge opening at one side of the harvester,

an unloading tube having a main portion and an end portion angled with respect to the main portion, the angled portion being pivotally mounted on the grain tank with the unloading tube in communication with the discharge opening, the pivot axis between the tube and the grain tank being inclined so as to extend upwardly in a direction towards the central vertical fore-and-aft plane of the combine harvester and the unloading tube being pivotally

movable throughout a range of unloading positions in all of which the main portion of the tube extends substantially laterally with respect to the central fore-and-aft plane,

an unloading auger disposed in the main portion of the unloading tube and having a receiving end spaced from the pivotal connection between the tube and the tank,

a grain tank auger extending within the grain tank and having a discharge end spaced from the pivotal connection between the tube and the tank,

an intermediate shaft extending between the discharge end of the grain tank auger and the receiving end of the unloading auger, the intermediate shaft being telescopic, and

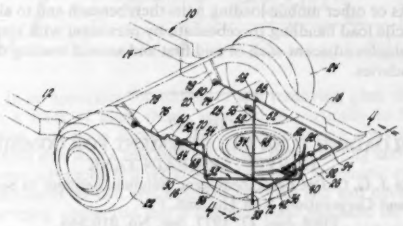
a pair of universal joints, respectively disposed at the ends of the intermediate shaft and at opposite sides of the pivotal connection between the tank and the tube, the universal joints respectively connecting the discharge end of the grain tank auger to one end of the intermediate shaft, and the receiving end of the unloading auger to the other end of the intermediate shaft.

4,093,088

UNDERFLOOR TIRE STORAGE

William V. Hildebrandt, and Allan G. Miller, both of Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 12, 1977, Ser. No. 796,127
Int. Cl.² B62D *43/04*
U.S. Cl. 214—451 **3 Claims**



1. In a vehicle, an assembly to support a spare tire in a generally horizontal orientation beneath the vehicle floor and forward of the rear of the vehicle, comprising: a tire cradle of lightweight construction formed of bent rod members and including lower portions adapted to extend beneath the tire for vertical support thereof, upwardly angled portions integrally connected to the lower portions extending beneath the tire to locate said tire in a horizontal plane and a rearward portion extending adjacent the rear edge of the tire; a tire cradle support assembly having a generally U-shaped configuration also formed of lightweight bent rod construction including a pair of leg portions, each extending in fore and aft orientation with respect to the vehicle and in spaced parallelism to one another, the forward ends of said leg portions being attached to the vehicle in a manner permitting pivotal movement of the tire cradle support, the rearward end portions of the cradle support leg portions being integrally joined by an intermediate portion spaced above the rearward portion of said tire cradle; a slidable guide member supported on each of said leg portions; means attaching each of the forward ends of said tire cradle to one of said guide members for permitting limited rotation of said cradle with respect to said cradle support; elongated actuating means for supporting said tire cradle and cradle support in an upward stowed position and extending through opening in the vehicle floor for selective raising and lowering of the rear portion of said tire cradle and cradle support from above, the engagement between the lower end of the elongated actuating means and the tire cradle and support being selectively detachable once the tire is lowered to rest on the ground for permitting subsequent rearward sliding movement of the guide members along said leg portions and corresponding rearward movement of the tire and tire cradle with respect to said cradle support and the vehicle to clear the tire of the vehicle rear overhang.

4,093,089

ARRANGEMENT PARTICULARLY IN GOODS VEHICLE FOR CONVEYANCE OF LOAD CARRIERS POSITIONED IN DOUBLE OR MULTIPLE ROWS

Gote Hubert Bohman, Hudiksvall, Sweden, assignor to B.V. Foco Nederland, Meppel, Netherlands

Continuation of Ser. No. 609,519, Sep. 2, 1975, abandoned. This application June 13, 1977, Ser. No. 805,892
Claims priority, application Sweden, Sept. 3, 1974, 7411111
Int. Cl.² B60P *1/38*
U.S. Cl. 214—516 **4 Claims**

1. An arrangement particularly in goods vehicles provided with a loading platform of the kind comprising a continuous conveyor means, two pulleys, one positioned at the rear end of said platform and the other one at the front end of said platform, said continuous conveyor means running over said two pulleys, equidistantly spaced driving carriages provided on said conveyor means, at least two load-carrier means in the form of a transport container arranged to be coupled to each one of said driving carriages, the arrangement comprising an outwardly projecting driving arm on each one of said driving carriages, members mounted on said arm at various distances from the respective carriage, each one of said members arranged to connect a load carrier to an associated driving carriage, guide rails provided on the lower face of each one of said load-carrier means in a position so as to diverge towards one end of said load-carrier means, the arrangement comprising guide means matching said rails, said guide means provided on said driving arms, a blocking means arranged on said driving arm at each one of said guide means, and a catch shoulder formed on each load-carrier means, said guide means arranged to cooperate with said catch shoulders, and wherein said blocking means on said driving arms is a two-arm lever one arm of which, the blocking arm, is arranged to cooperate with said catch shoulder formed on said load-carrier means, the arrangement comprising a piston slidably arranged in a cylinder at the rear end of said loading platform, said piston arranged when displaced upwards, to abut against the opposite arm of the respective one of said levers in order to pivot said blocking arm against the action of a spring means out of engagement with said catch shoulder formed on that one of said load-carrier means which at that moment is positioned immediately above.

4,093,090

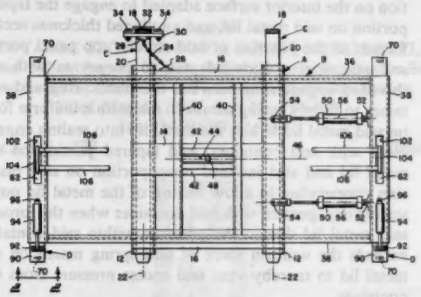
SPREADER FOR LIFTING CONTAINERS

Donald R. Whiteman, Roxboro, N.C., assignor to RPC Corporation, Roxboro, N.C.

Filed Nov. 29, 1974, Ser. No. 528,167
Int. Cl.² B66F *9/14*
U.S. Cl. 214—620 **14 Claims**

10. In a generally rectangular container lifting spreader frame having a longitudinal axis and container engaging devices at the corners thereof, the improvement comprising; said container engaging devices being slidably movably mounted

on said frame for movement in unison in the same direction generally perpendicular to said longitudinal axis without moving upwardly or downwardly relative to said frame, and power means for so moving said container engaging devices.

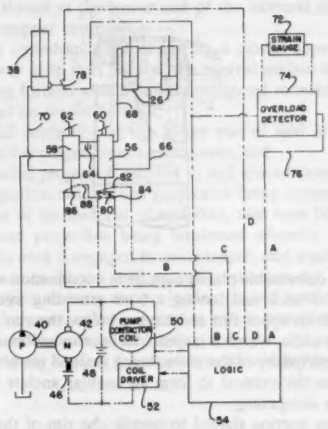


4,093,091

LOAD MOMENT SENSING SYSTEM FOR LIFT TRUCKS

Edmund Gregg, Willowick, and Grant C. Melocik, Chardon, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jun. 30, 1976, Ser. No. 701,336
Int. Cl.[2] B65G *47/00*
U.S. Cl. 214—673 **5 Claims**



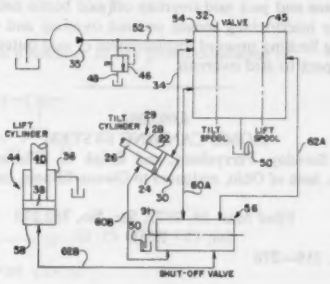
1. A lift truck comprising:
a vehicle frame;
ground engaging means on said frame whereby said truck may traverse the underlying terrain;
an upright mast adjacent an end thereof and pivoted to said frame about a substantially horizontal axis;
a lift carriage mounted on said mast for up and down movement thereon;
first motor means for tilting said mast toward and away from said end about said axis;
second motor means for moving said lift carriage up and down on said mast;
manually operable control means for selectively energizing said first and second motor means;
overload sensing means on said frame;
means for sensing when said carriage is above a predetermined position on said mast;
signal producing means operatively connected to said manually operable control means for providing signals representing tilt toward, tilt away, up and down carriage commands; and
a logic system connected to and responsive to both said sensing means and said signal producing means for
(a) preventing energization of said first motor means for tilting in either direction and said second motor for lifting when an overload has been sensed and when said signal producing means are issuing an up carriage command signal;
(b) allowing energization of said first motor means for tilting toward said frame only when an overload has been sensed and when said carriage is above said predetermined position and when said signal producing means are not issuing an up carriage command signal; and
(c) allowing energization of said first motor means for tilting in either direction when an overload has been sensed and said carriage is not above said predetermined position.

4,093,092

LOAD LIMITING DEVICE

Cyril W. Habiger, Joliet, and Tom E. Robinson, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1976, Ser. No. 669,936
Int. Cl.[2] B66F *9/20*
U.S. Cl. 214—674 **12 Claims**



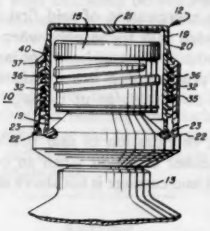
1. In a load lifting apparatus which comprises a primary load member pivotally mounted about a generally horizontal axis on a frame, a tilt cylinder and a tilt piston movable relative to one another pivotally connected to the frame and the primary load member to provide impetus for pivotal movement therebetween, a secondary load member movable relative to the primary load member, a lift cylinder and a lift piston movable relative to one another connected to the primary load member and the secondary load member to provide impetus for linear relative movement therebetween, tilt cylinder valve means for controlling flow of pressurized fluid from pump means to said tilt cylinder and lift cylinder valve means for controlling flow of pressurized fluid from said pump means to said lift cylinder, an improvement for protecting said apparatus from overbalancing by sensing a moment created by a load on said apparatus, comprising:
a valve sensing simultaneously a lift pressure force proportional to a lift pressure in a head end of said lift cylinder and a tilt pressure force proportional to a tilt pressure in a rod end of said tilt cylinder, said valve blocking flow of pressurized fluid from the rod end of said tilt cylinder to said tilt cylinder valve means and from said lift cylinder valve means to the head end of said lift cylinder responsive to the greater of said lift pressure force and said tilt pressure force exceeding a predetermined value,

4,093,093

ANTIBACKOFF CLOSURE

Thomas A. Fowles, McHenry, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 14, 1977, Ser. No. 777,750
Int. Cl.[2] B65D *41/62*
U.S. Cl. 215—251 6 Claims



1. An improvement in a hermetically sealed container for storing and dispensing sterile liquids, said container including a bottle with a neck defining a dispensing outlet, said bottle having a transverse abutment means on the neck surrounding the outlet, said improvement comprising, in combination:

an overcap having a cylindrical side wall and a top wall fitted on said bottle neck over said dispensing outlet, said overcap being hermetically sealed to said bottle neck;

an outer ring threadedly interfitted over said overcap and adapted for downward rotation to abut said abutment means and jack said overcap off said bottle neck; and

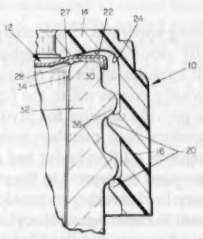
axially interlocking means on said overcap and said outer ring limiting upward displacement of said outer ring with respect to said overcap.

4,093,094

HOME CANNING SYSTEM

Ned J. Smalley, Perrysburg, and Ralph H. Whitney, Whitehouse, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 28, 1977, Ser. No. 782,272
Int. Cl.[2] B65D *45/10*
U.S. Cl. 215—276 1 Claim



1. An improved home canning closure system for a container having a threaded neck portion terminating in an annular rim defining the periphery of an open mouth, said closure system including:

a metal lid covering and closing the open mouth of said container and having a sealant means positioned around the periphery of its lower surface and adapted to sealingly engage the annular rim defining the open mouth of said container, said metal lid including an upwardly and outwardly tapered portion positioned radially inwardly from said sealant means; and

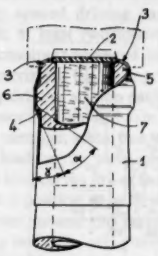
a plastic ring adapted to be placed over the metal lid and including an annular top panel portion and a skirt portion depending therefrom, the skirt portion incorporating buttress style threads adapted to engage the threaded neck portion on said container, the annular top panel portion including an upwardly and outwardly inclined ramp portion on the interior surface adapted to engage the tapered portion on said metal lid, and a reduced thickness section formed at the junction of said annular top panel portion and said skirt portion adapted to cooperate with said threaded engagement between the plastic ring and container to form a spring means to maintain a uniform force on said metal lid to bias the metal lid into sealing engagement with said container, said tapered portion on said metal lid and said inclined ramp portion on said plastic ring cooperating to allow flexing of the metal lid out of sealing engagement with said container when the force on said metal lid due to the pressure within said container exceeds the uniform force of said spring means on said metal lid to thereby vent said excess pressure from said container.

4,093,095

STOPPER-COVERING CAPSULE FOR A BOTTLE

Pierre Babiol, Villefranche-sur-Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques S.N.B.P., Paris, France

Filed Feb. 23, 1977, Ser. No. 771,129
Claims priority, application France, Feb. 27, 1976, 76 06230; Jul. 13, 1976, 76 22021
Int. Cl.[2] B65D *41/18*
U.S. Cl. 215—307 10 Claims



1. A deformable plastic capsule in combination with a bottle having a neck and having a bore extending into the bottle through an upper rim and having below the rim an enlarged annular collar which is trapezoidal in cross-sectional shape, the lower periphery of the collar being stepped inwardly at a first angle to the vertical to form an annular anchor surface, the capsule comprising:

a base portion shaped to overlie the rim of the bottle and cover its bore;

a thin-wall cylindrical skirt portion integrally joining the base portion, the skirt portion being of lesser diameter than the diameter of the bottle neck and conforming approximately with the shape of the bottle neck and collar when fitted thereon, and the skirt portion being of axial length greater than the distance between the rim and the anchor surface of the collar; and

the skirt portion having an annular inwardly-extending retaining rib which is triangular in cross-section and extends around the inner surface of the skirt wall, the retaining rib being spaced from the base portion of the capsule and located to fit below the lower periphery of the collar against the anchor surface, the retaining rib having an upper-oblique surface which before the capsule is fitted to a bottle forms with the axial sidewall of the skirt portion a second angle, and the rib being so formed that after the capsule is fitted to a bottle the outer surface of the skirt will be inclined inwardly in the vicinity of the lower

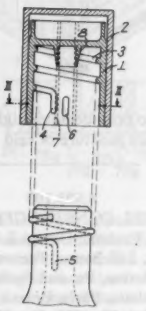
periphery of the collar at a third angle, the sum of the second and third angles equalling the first angle.

4,093,096

REMOVABLE STOPPER FOR A SCREW-NECK BOTTLE

Jacques Julien Augros, Villiers le Bel, France, assignor to Societe Anonyme dite: Arts et Techniques Nouvelles, France

Filed May 19, 1977, Ser. No. 798,455
Int. Cl.[2] B65D *41/04*
U.S. Cl. 215—330 4 Claims



1. A removable stopper for a screw-neck bottle wherein the bottle neck is formed with a radial projection arranged transverse to the thread at the lower end of the external surface thereof, said stopper comprising:

a generally cylindrical closure having a closed upper end and a lower open skirt portion, the internal surface of said skirt being formed with a thread configured to mate with the thread on the bottle neck;

a first radial projection at the lower end of said internal thread and arranged transverse thereto; and

a second radial projection parallel to and spaced from said first projection, said second projection being surrounded by a zone of the material of said skirt, said zone bearing said second projection being weakened whereby when said bottle neck is engaged by said stopper, said weakened zone flexes to permit said second projection to move radially upon abutting the projection on said bottle neck to pass thereover when moving in either direction, said first and second projections being arranged and configured to closely confine the projection on said bottle neck.

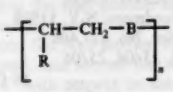
4,093,097

PLASTISOL COMPOSITION AND CONTAINER CLOSURE GASKET MADE THEREFROM

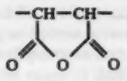
Walter Robert Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 563,018, Mar. 28, 1975, Pat. No. 4,020,966. This application Jan. 10, 1977, Ser. No. 758,093
Int. Cl.[2] B65D *53/04, 53/06;* C08K *5/17;* C08L *23/00*
U.S. Cl. 215—349 5 Claims

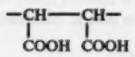
1. A plastisol composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



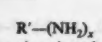
wherein B is a member of the group consisting of



and

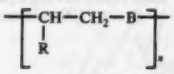


R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of an amine plasticizer having the formula

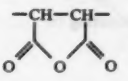


wherein x is at least one and R′ is an organic moiety having an aromatic, aliphatic, cycloaliphatic, heterocyclic or a combination of aromatic and aliphatic groups therein.

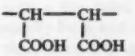
2. A container closure comprising a cap having deposited therein a resinous mass functioning as a gasket to seal the container when the closure is in sealing relationship with the container, said resinous mass comprising a fluxed plastisol of a composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



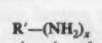
wherein B is a member of the group consisting of



and



R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of an amine plasticizer having the formula



wherein x is at least one and R′ is an organic moiety having an aromatic, aliphatic, cycloaliphatic, heterocyclic or a combination of aromatic and aliphatic groups therein.

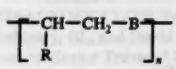
4,093,098

PLASTISOL COMPOSITION AND CONTAINER CLOSURE GASKET MADE THEREFROM

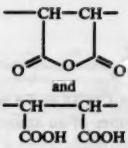
Walter Robert Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 563,018, Mar. 28, 1975, Pat. No. 4,020,966. This application Jan. 10, 1977, Ser. No. 758,232
Int. Cl.[2] B65D *53/04, 53/06;* C08K *5/16;* C08L *23/00*
U.S. Cl. 215—349 5 Claims

1. A plastisol composition comprising (a) a compolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of

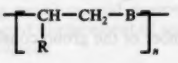


R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of an isocyanate plasticizer having the formula

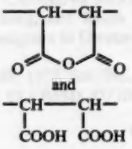
$R'—(NCO)_x$ ps

wherein x is at least one and R' is a C_1 to C_{36} organic moiety selected from the group consisting essentially of aryl, aralkyl, cycloalkyl, alkyl, substituted aryl, substituted aralky, substituted cycloalkyl, substituted alkyl and mixtures thereof.

2. A container closure comprising a cap having deposited therein a resinous mass functioning as a gasket to seal the container when the closure is in sealing relationship with the container, said resinous mass comprising a fluxed plastisol of a composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of



R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of an isocyanate plasticizer having the formula

$R'—(NCO)_x$ wherein x is at least one, and R' is a C_1 to C_{36} organic moiety selected from the group consisting essentially of aryl, aralkyl, cycloalkyl, alkyl, substituted aryl, substituted aralkyl, substituted cycloalkyl, substituted alkyl and mixtures thereof.

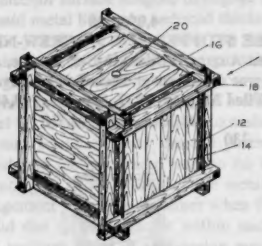
4,093,099

RECTANGULAR CONTAINER FOR THE AGING OF ALCOHOLIC BEVERAGES

James E. Spooner, 2360 A 46th St., Los Alamos, N. Mex. 87544

Filed Sep. 11, 1975, Ser. No. 612,342
Int. Cl.² B65D *9/12, 25/00, 61/00*
U.S. Cl. 217—72 **3 Claims**

1. A box-like container for the aging of alcoholic beverages and the like, said container being comprised of six rectangular planar panels, any three mutually adjacent panels being mutually perpendicular to each other and defining a corner of said container, any one panel contacting an adjacent panel in face to edge relation and the third panel of any three mutually adjacent panels in edge to face relation, the rectangular panels meeting at each corner in overlapping face to edge relation and leaving a cubical gap at said corner and a plug means provided at said gap to prevent leakage at said corner all of said panels and the plug means being held in tight box-like form by a



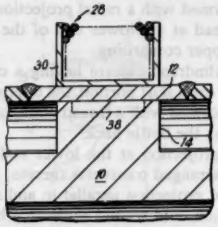
prestressing means to provide liquid tight contact at the face to edge and edge to face juncture of said panels.

4,093,100

PRESSURE VESSEL CONSTRUCTION AND METHOD

Hugh Ford, London, England; George J. Mraz, Warren, Pa., and Jean Noel Simier, Lillebonne, France, assignors to National Force Company, Irvine, Pa. and Societe Chimique des Charbonnages-CDF Chimie, Paris, France

Filed Oct. 28, 1975, Ser. No. 626,084
Int. Cl.² B65D *7/22, 7/44*
U.S. Cl. 220—3 **7 Claims**



1. An improved vessel which comprises:
(a) a pressure vessel having a unitary, high strength alloy steel side wall;
(b) at least one flange integral with and extending radially outwardly from said side wall;
(c) at least one ring extending entirely around but not welded to said flange, said ring being comprised of a weldable material having a tensile strength which is less than the tensile strength of the wall of said pressure vessel;
(d) a temperature control jacket surrounding and radially spaced outwardly from the wall of said pressure vessel, at least one end of said temperature control jacket being welded to said at least one weldable ring; and
(e) ring compressing means extending entirely around and in contact with said at least one weldable ring, said ring compressing means being tensilely stressed and said at least one weldable ring being compressively stressed against said flange by said ring compressing means.

4,093,101

PARTITIONED PLASTIC CASE

Bernard Braun, 834 Moore St., Woodmere, N.Y. 11598

Filed Aug. 25, 1977, Ser. No. 827,468
Int. Cl.² B65D *1/36, 25/04, 25/06*
U.S. Cl. 220—22 **16 Claims**

1. In a molded plastic case having a pair of spaced-apart side walls, a pair of spaced-apart end walls and a bottom wall

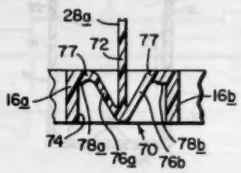
connected together to form a generally rectangular shell, the improvement comprising a partition structure molded in situ in the shell at the time the shell is formed, said partition structure including

A. one or more partition sections extending generally perpendicular to the case bottom wall, and

B. means formed integrally with each partition section and the case bottom wall connecting the partition section to the case bottom wall, said connecting means comprising

1. means defining an opening in the case bottom wall,

2. a tab projecting from the bottom edge of the partition section into said opening,



3. a pair of webs extending in opposite directions from the lower edge of said tab to the opposite edges of said opening near the top thereof, and

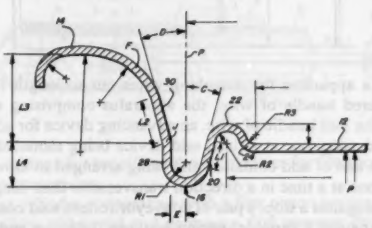
4. a pair of projecting surfaces located in the bottom wall just below the junctions of the webs and the adjacent opening edges, said surfaces extending toward one another and being substantially coextensive with said webs so that after the juntions between the webs and the opening edges are broken to free the partition section from the shell, the webs can be flexed so that their free ends resiliently engage under the projecting surfaces and re-anchor the partition section to the bottom wall.

4,093,102

END PANEL FOR CONTAINERS

John L. Kraska, Riverside, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Aug. 26, 1974, Ser. No. 500,706
Int. Cl.[2] B65D 7/44
U.S. Cl. 220—67 **6 Claims**



1. An end panel for containers consisting of a panel having a substantially flat central panel portion, a first bead surrounding said central panel portion and comprising an inverted U-shaped arcuate portion extending from and raised above said central panel and extending downwardly into a first flat wall portion, said first bead having a first radius and said first flat wall portion defining an angle greater than 10° and less than 16° with respect to a plane extending perpendicular to said flat central portion, a second bead extending from the outer end of said first flat wall portion and comprising a U-shaped portion, said first flat wall portion having a length sufficient to locate said second bead entirely below the level of said central panel, a second flat wall portion extending upwardly from said second bead, said second flat wall portion defining an angle less than 4° with respect to said plane, a third flat wall portion integral with an outer edge of said second flat wall portion, said third flat wall portion defining an angle in the range of 14 to 16° with respect to said plane, said second bead and said second flat wall portion being dimensioned so that the distance along said plane between the juncture of said second and third flat wall portions and the peripheral edge of said second bead is in the range of 0.080 0.094 inches, and a peripheral curl on the periphery of said third flat wall portion adapted to be seamed to a container body so that pressure applied to said central panel portion will vary said angles and thereby increase the resistance of said end to buckling. --

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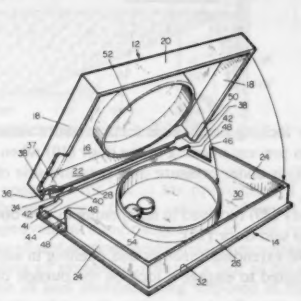
4,093,103

TABLET CONTAINER

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 22, 1977, Ser. No. 770,555
Int. Cl.[2] B65D 43/16
U.S. Cl. 220—283 **9 Claims**



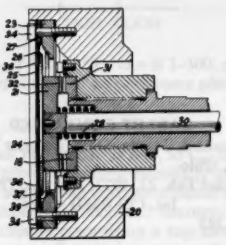
1. A selectively openable, telescopically closeable tablet container molded as a single piece, said container comprising: a lid with a top panel having a peripheral skirt depending downwardly from said top panel; a base having a bottom panel and a skirt extending upwardly from said bottom panel, said base skirt having at least one downwardly extending surface which merges with an upper surface of said base skirt to define a fulcrum; hinge means joining said lid and base and allowing for said lid and base to be brought into telescopic relation; motion limiting means disposed inwardly of said hinge means for limiting relative closer approaching movement of said top panel and said bottom panel, when said lid and base are in closed telescopic relation, to a non-opening position; first wall means integral with top panel and second wall means integral with said bottom panel, said first and second wall means being inter-engageable to define a sealed, internally disposed tablet chamber upon relative telescopic positioning of said lid and base; displaced surface means generally disposed along the periphery of said container, at a location intermediate said motion limiting means and said fulcrum, so arranged and constructed that upon compression of adjacent portions of said top panel and bottom panel said surface means are brought into closer proximity to each so as to produce, along with contact of an internal surface portion of said top panel with said fulcrum, a lever-like action which disengages said first and second wall means to open said container and tablet chamber; and cam means, generally disposed along the periphery of said container intermediate said fulcrum and said displaces surface means, so arranged and constructed that upon said compression of said top and bottom panels a portion of said peripheral skirt of said lid is forced outwardly.

4,093,104

RUBBER DIAPHRAGM TYPE DOOR LOCKING MECHANISM

John W. Hutchinson, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Aug. 26, 1976, Ser. No. 717,918
Int. Cl.[2] B65D *45/00*
U.S. Cl. 220—316 2 Claims



1. A door locking mechanism for a pressure vessel having a door (10), to prevent opening of the door (10) when gas in said chamber (41) is under pressure on a pressure side of said door comprising,

a lock body (20) received in an opening in said door (10) and fixed to said door (10),

a shaft (30) extending through said opening in said door (10) and adapted to engage a lock on the outside of said door (10),

first teeth (31) on said lock body (20),

means (21) supporting second teeth (32) on said shaft (30) overlying said first teeth (31) on said lock body (20),

a pressure plate (24),

said means on said shaft engaging said pressure plate (21),

an annular seat (23) supported on said lock body (20) and having a first flat surface on the side remote from said lock body (20),

said annular seat (23) having a bore therethrough and a counterbore of said bore terminating in a second flat surface (37) surrounding said bore, said second flat surface being spaced outwardly relative to said vessel from said first flat surface,

said pressure plate (24) being disposed in said counterbore and adapted to rest on said second flat surface (37),

a diaphragm (25) overlying said counterbore and resting on said pressure plate (24) and on said first flat surface (23),

means sealing said diaphragm (25) to said first flat surface of said seat (23) providing a closure for said bore and said counterbore,

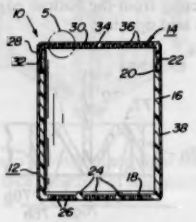
said counterbore in said seat (23) being defined by an annular contoured surface (39) inclined from said first flat surface and terminating at said second flat surface (37) and said contoured surface and said pressure plate being adapted to provide a smooth, continuous surface for supporting said diaphragm (25) when a gas under pressure in said vessel forces said diaphragm and in turn said pressure plate outwardly towards said second flat surface to in turn force said second teeth into engagement with said first teeth whereby said shaft is restrained against rotation, thereby preventing said lock from being opened when a pressure exists in said chamber.

4,093,105

PLASTIC CONTAINER WITH VENT MEANS

Walter W. Russell, Philadelphia, Pa., and Richard P. Stoetzer, Cinnaminson, N.J., assignors to N. T. Gates Company, Pennsauken, N.J.

Filed Oct. 19, 1977, Ser. No. 843,631
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—373 10 Claims



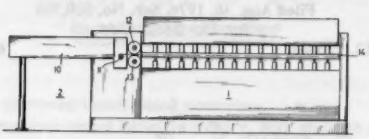
1. A container comprising a plastic cup-shaped body, and a plastic cap removably fitting on said body, each of said body and cap having a plurality of small holes therethrough with said holes being larger in area at the inner surface of the container than at the outer surface thereof.

4,093,106

APPARATUS FOR DETACHING WIRES CUT TO LENGTH FROM A DISORDERED BUNDLE OF WIRE

Hans Gött; Josef Ritter; Klaus Ritter, and Gerhard Ritter, all of Graz,, Austria, assignors to EVG Entwicklungs-u. Verwertungs Gesellschaft mbH, Graz, Austria

Filed Mar. 31, 1976, Ser. No. 672,059
Claims priority, application Austria, Apr. 2, 1975, 2506/75
Int. Cl.[2] B65G *61/00*
U.S. Cl. 221—224 8 Claims



1. An apparatus for detaching wires cut to length from a disordered bundle of wire, the apparatus comprising a container for said bundle of wire, an advancing device for advancing said wires one at a time, said device being mounted adjacent an end of said container and being arranged to move said wires one at a time in a direction transverse to their longitudinal axis against a stop, a pair of conveyor rollers, said conveyor rollers having a variable spacing between their axes and being mounted adjacent said stop, said rollers being arranged to grasp the end of each wire one at a time as it is brought against said stop by said device, and to pull said wire out of said bundle in a substantially axial direction.

4,093,107

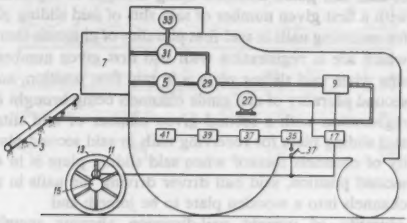
SPRAYING EQUIPMENT

Denis John Allman, Chichester, and Lionel Ivor Alfred Taylor, Southampton, both of England, assignors to E. Allman and Company Limited, England

Filed May 14, 1976, Ser. No. 686,593
Claims priority, application United Kingdom, May 16, 1975, 21028/75
Int. Cl.[2] B05B *9/06*
U.S. Cl. 222—23 9 Claims

1. A device for determining the volume of spraying liquid which is applied per unit area of ground by spraying equipment

comprising means for generating a first electrical signal representing the rate of supply of spraying liquid to the ground, means for generating a second electrical signal representing the speed at which the equipment is traversing the ground, function generating means, means for applying said first and said second electrical signals to said function generating means for generating in response thereto an output signal equal to the product of a predetermined factor and the ratio between the



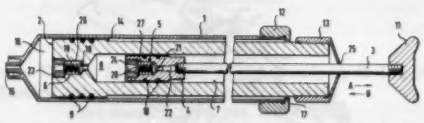
first and second signals, the said predetermined factor representing the ratio between the distance travelled by the equipment and the area of ground to which spraying liquid is applied during travel over that distance so that the output signal represents the volume of spraying liquid applied to unit area of the ground, and means for applying said output signal to a visual indicator means, which provides a visual indication of said volume applied to unit area of ground.

4,093,108

SYRINGE ADAPTED TO OVERCOME A PRESSURE RESISTANCE

Wolfgang Hein, Dassel, and Peter Grundmann, Konigswinter, both of Germany, assignors to Carl Schleicher & Schull, Einbeck, Germany

Continuation of Ser. No. 594,633, Jul. 10, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,427
Claims priority, application Germany, Nov. 7, 1974, 2433399
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—401 **2 Claims**



1. A syringe for expelling a liquid medium for filtration, said syringe comprising:

a first cylinder cooperating with a first piston having a first hollow piston rod and defining a first pressure chamber, the hollow portion of said hollow piston rod defining a second cylinder having a smaller cross section than said first cylinder and cooperating with a second piston having a second piston rod and defining in said second cylinder a second pressure chamber;

a bore formed within said first piston connecting said first and second pressure chambers;

a valve in said bore having a valve closure element and means biasing said valve closure element to open the valve upon an over-pressure in said second pressure chamber;

an inlet/outlet attachment for the liquid medium opening into said first pressure chamber;

an air inlet duct formed in said second piston opening into said second pressure chamber;

a second valve that opens in response to an underpressure in said second pressure chamber during an air intake stroke of said second piston and closes in response to an air over-pressure in said second pressure chamber during an air pressurizing stroke of said second piston, said second valve being in communication with said air inlet duct;

a cover for said first cylinder;

a stop on said first piston which is able to abut said cover in the extreme intake stroke position of the first piston; and

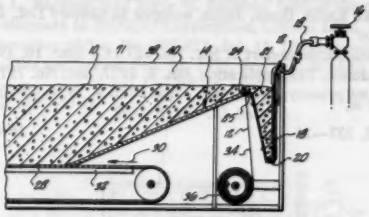
with ssid liquid medium charged into said first pressure chamber by means of an intake stroke of the first piston being expelled by means of an air over-pressure provided upon said liquid medium within said first pressure chamber by means of a pumping action of said second piston.

4,093,109

EXPANSIBLE TROUGH APPARATUS FOR USE IN PRODUCING POLYURETHANE FOAM

Milford J. Schrader, 525 Cinderella Dr., Claremont, Calif. 91711

Filed Sep. 20, 1976, Ser. No. 725,108
Int. Cl.[2] B29D *27/00, 27/04*
U.S. Cl. 222—527 **8 Claims**



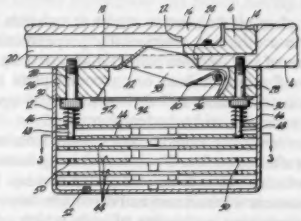
8. In an apparatus for use in the production of continuous buns of polymeric foam from a mixture of liquid foam reactants, an improvement comprising a pair of open ended trough sections, one of said sections being slidably mounted within the other to define an expansible trough, a pair of detachable end sections, one of said sections being disposed at the extended end of each of said trough sections, means for securing each of said end sections to said extended ends of said trough sections, guide means carried by said end sections and said trough sections, said means carried by said end sections cooperating with said means carried by said trough sections for aligning said end sections with said trough sections and a protective lining disposed within the interior of said trough sections to prevent contact between said trough sections and said liquid foam reactants.

4,093,110

NOISE AND FOULING REDUCER FOR POWDER-ACTUATED TOOL

Peter Walton Johnson, Toronto, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 11, 1977, Ser. No. 776,570
Int. Cl.[2] B25C *1/18*
U.S. Cl. 227—9 **12 Claims**



1. A powder-actuated tool for driving fasteners into support-

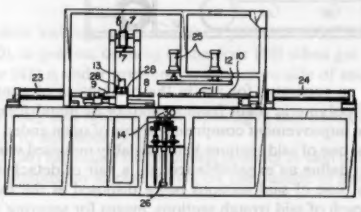
ing structures, said tool comprising: a firing chamber for receiving a powder charge; a barrel having a bore into which combustion gases from the powder charge are directed to power the tool; gas passage means extending from said barrel bore into a chamber on the tool for receiving the combustion gases; and a plurality of baffle plates mounted in said chamber to provide increased surface area therein for deposition of fouling deposits from the combustion gases and for muffling the sound of the expanding combustion gases; said baffle plates being arranged in a stack within said chamber with passages being formed in the individual baffle plates to allow the combustion gases to infiltrate said stack; each of said baffle plates being identical to the others in construction, and said baffle plates being loosely stacked within said chamber so as to be removable therefrom for cleaning; and spring means for biasing said baffle plates into engagement with each other to retain the composition of said stack.

4,093,111

AUTOMATED APPARATUS FOR JOINING WOOD PLATES IN SIDE-BY-SIDE RELATION

Sadahiko Katoh, Ikeda, Japan, assignor to Suntory Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 557,117, Mar. 10, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,152
Claims priority, application Japan, Jul. 4, 1974, 49-76715
Int. Cl.[2] B27F 7/02
U.S. Cl. 227—26 **16 Claims**



1. In an automated apparatus for joining a set of a plurality of wooden plates with adjoining surfaces in a side-by-side relation, including:

conveyor means for transporting said wooden plates in sequence to a given position;

joining means at said given position for receiving thereon said plurality of wooden plates thus transported one-by-one by said conveyor means, said joining means including:

nail driving means including a nail driver which is reciprocable over a given distance in a direction substantially perpendicular to the surfaces of said wooden plates which are to be joined; platen means, on which adjacent wooden plates are supported in substantially parallel abutting relation;

a hold-down plate positioned above said platen means and being movable upwards and downwards relative to said platen means to hold said wooden plates fast or release same;

wooden plate holding means which is movable back and forth in a direction substantially perpendicular to the surfaces of said wooden plates which are to be joined to hold and retain at least one wooden plate in a fixed position when said nail driving means is operated to drive nails into said wooden plates; and

means for removing joined wooden plates from said platen means after operation of said nail driving means to clear said wooden plates from said platen means;

the improvement wherein said nail driving means comprises:

a hopper containing a plurality of nails which are aligned substantially in a given direction, said hopper having a bottom opening for passing said nails out of said hopper;

a sliding plate having a given number of slits which are adapted to admit nails therethrough and spaced given distances apart, said sliding plate being disposed under but in contact with said bottom opening of said hopper and slidably movable relative to said hopper between at least a first position and a second position;

nail guide means located below said sliding plate, between the platen means and said nail driver means, said nail guide means having nail guide channels therein, a first plurality of said nail guide channels being brought in registration with a first given number of said slits of said sliding plate for receiving nails in said first plurality of channels thereof which are in registration with said first given number of slits when said sliding plate is in said first position, and a second plurality of nail guide channels being brought into registration with a second given number of said slits of said sliding plate for receiving nails in said second plurality of channels thereof when said sliding plate is in said second position, said nail driver driving the nails in said channels into a wooden plate to be joined; and

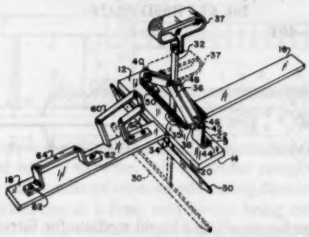
a plurality of upright nail-direction aligning members mounted in said hopper in the positions over said channels for maintaining said nails in alignment.

4,093,112

FLAP POSITIONING ASSEMBLY

Clifford Henry Faulkingham, 3500 Heatherington Rd., Orlando, Fla. 32804

Filed Apr. 4, 1977, Ser. No. 784,061
Int. Cl.[2] B25C 7/00
U.S. Cl. 227—150 **9 Claims**



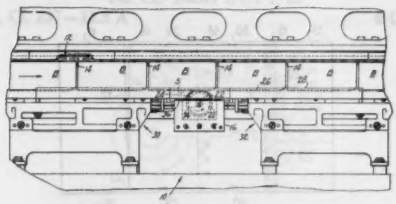
1. A flap positioning assembly of the type primarily used to facilitate stapling of a container, said flap positioning assembly comprising: support frame means positionable at least in part on the exterior of the container and including a base plate, support means extending outwardly from said base plate; positioning means movably attached to said support frame means and including clamp means movably positionable in spaced apart relation to said base plate and comprising at least in part an elongated configuration, said clamp means further disposed in corresponding relation to said support frame means so as to securely engage a flap portion of the container between said support frame means and said clamp means; and connecting means movably interconnected between said positioning means and said support frame means and including a plurality of linkage elements pivotally connected between said positioning means and said base plate and disposed to at least partially define movement of said positioning means between a clamped and non-clamped position.

4,093,113

SEAM SOLDERING MECHANISM

Frederick Stirling Sillars, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Feb. 8, 1977, Ser. No. 766,779
Int. Cl.[2] B23K 1/16, 3/06
U.S. Cl. 228—36 2 Claims



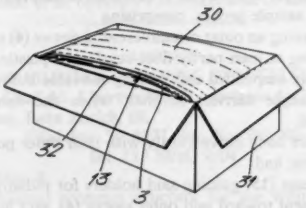
1. Mechanism for soldering seams of cans and the like comprising, in combination with means for guiding and moving the cans in one direction along a path with their seams in predetermined orientation, an applicator roll movable in the path of seam travel counter to said one direction and having one portion which, during operation of the mechanism, is arranged to pass through a bath of molten solder and thence through an anti-oxidation or de-oxidizing atmosphere to present another previously solder-wetted applicator roll portion in substantially continuous tangential relation progressively along the length of the joint of each seam, the roll being disc-like and having a rim formed to substantially correspond in width with the openings of the respective seam joints, a single means for enshrouding the bath and the wetted portion in said atmosphere, and a drive shaft for the roll driven independently of the can moving means and extending transversely of and beneath said path, the shaft being substantially horizontal and journaled heightwise between said can guiding means and the surface level of the solder bath to cause an upper portion of the roll rim to engage and wipe opposite entrance edges of the seam joints progressively and thereby apply a positive pressure causing the solder being transferred by the rim to penetrate into each seam joint.

4,093,114

PLASTICS BAG

Norman Edward Lawes, Yarm, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 21, 1976, Ser. No. 698,219
Claims priority, application United Kingdom, Jul. 3, 1975, 28046/75; Aug. 6, 1975, 32851/75
The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.[2] B65D 5/60
U.S. Cl. 220—46.2 10 Claims



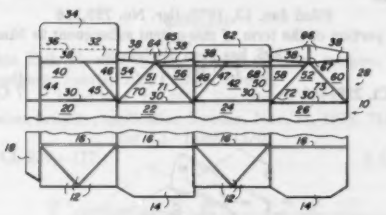
1. A packaging container comprising a stiff outer casing and a plastics-film liner, the improvement consisting in that the liner is a valved bag formed from a length comprising two plies of plastics film, the length being folded and joined to provide a bag having one wall formed by overlapping panels, the ends of the bag being closed and the overlapping panels being joined together by a longitudinal seal located along the edge region of the outer panel, the longitudinal seal being interrupted to provide a valve opening with transverse seals at each side of the valve opening defining a passageway constituting a filling valve between the panels, the outer panel comprising the two plies with their edges coextensive and the inner panel comprising the two plies together with at least one layer of flexible material in addition to said two plies at least throughout the valve region, the two plies and the additional layer which comprise the inner panel being arranged with their edges staggered such that all three edges may contact the inner ply of the outer panel, the additional layer being joined to the two plies of the inner panel at least by the transverse seals and being located with at least one of the plies of the inner panel lying between the additional layer and the outer panel in the area of overlap.

4,093,115

LIQUID-TIGHT FLAT TOP CONTAINER

George L. Bachner, and Jerry G. Bachner, both of Barrington, Ill., assignors to NIMCO Corporation, Crystal Lake, Ill.

Continuation of Ser. No. 488,852, Jul. 15, 1974, abandoned.
This application Feb. 11, 1977, Ser. No. 767,683
Int. Cl.[2] B65D 5/74
U.S. Cl. 229—17 G 30 Claims



1. In a blank of foldable sheet material for a container having conventional bottom closure panels, tabs, and fold lines for creating a liquid tight bottom closure and first, second, third, and fourth wall panels, said wall panels being joined by fold lines along their respective bottom edges to said bottom closure panels and tabs and said wall panels being arranged side by side each joined along a fold line to the panels adjacent to it, said wall panels being joined along fold lines at their respective top edges to an improved roof panel arrangement comprising in combination:

first and second rectangular roof panels each having first, second, third, and fourth edges, said first and second rectangular roof panels connected along their first edges respectively to the top edges of said first and said third wall panels;

first and second rectangular sealing tabs connected along fold lines respectively to the third edges of said first and second rectangular roof panels as extensions thereof;

first and second rectangular end panels having first, second, third, and fourth edges, connected along their first edges respectively to the top edges of said second and fourth wall panels, said first rectangular end panel connected along its fourth edge to said second edge of said first rectangular roof panel and along its second edge to said fourth edges of said second rectangular roof panel, said second rectangular end panel connected along its fourth edge to the second edges of said second rectangular roof panel and having its seconed edge free for closing engagement with the fourth edge of said first rectangular roof panel, each of said first and second rectangular end panels having a triangular end tab and first and second triangular fold-in tabs, said first and second triangular fold-in tabs being connected to said triangular end tab along fold lines,

said second triangular fold-in tab of said first rectangular end panel and said first triangular fold-in tab of said second rectangular end panel being scored for folding along a line substantially parallel to the third edge of said second rectangular roof panel and extending across said second triangular fold-in tab of said first rectangular end panel, said second rectangular roof panel and said first triangular fold-in tab of said second rectangular end panel;

first and second lip tabs connected along a fold line to the third edge of said first rectangular end panel as extensions thereof, said first lip tab connected along a fold line to said first rectangular sealing tab and said second lip tab connected along a fold line to said second rectangular sealing tab, said first and said second lip tabs being joined together along a fold line at their common edge;

first and second shim tabs connected along a fold line to the third edge of said second rectangular end panel as extensions thereof, said first shim tab connected along a fold line to said second rectangular sealing tab, said second shim tab free for closing engagement with said first rectangular shim tab, said first and said second shim tabs joined together along a fold line at their common edge.

4,093,116

PANEL INTERLOCKING MEANS

Richard Kenneth Watkins, Lithonia, and Leo Benatar, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 13, 1977, Ser. No. 759,116
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.² B65D *75/08*
U.S. Cl. 229—40 **7 Claims**

1. An arrangement for interlocking a pair of panels in overlapping relation, said arrangement comprising a locking tab struck from one of said panels and joined thereto at its base and having generally parallel side edges and a shoulder portion at the end thereof remote from said base, said shoulder portion comprising tapered side edges, a retaining tab struck from the other of said panels and joined thereto at its base and defining a locking aperture in said other panel for receiving said locking tab and being oriented so that the base of said retaining tab is remote from the base of said locking tab, and a transverse holding groove formed in said shoulder portion of said locking tab and extending partially through said shoulder portion and to the tapered edges thereof, for receiving the free end of said retaining tab when said locking tab is driven through said locking aperture whereby said locking and retaining tabs are maintained in angular mutually braced relation to each other.

4,093,117

MAILER

Henry Clifton Morse, 345 Fullerton Pkwy., Chicago, Ill. 60614

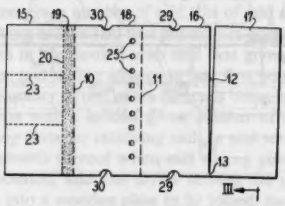
Filed Jun. 1, 1976, Ser. No. 691,853
Int. Cl.² B65D *27/00*
U.S. Cl. 229—70 **10 Claims**

1. For use as a mailer and communications device,

a one-piece stiff cardboard strip having parallel end edges extending from the length thereof and side edges connecting said end edges together and including four connected sections, three defined by fold lines, and a fourth defined by a slit extending for substantially the length of the fourth section,

a first section having an inner and an outer side and forming a mailing flap and having an adhesive strip extending along said inner side one of said fold line defining an inner side edge of said first section,

a second section comprising a back for the mailer,



a third section comprising a front for the mailer and folded over the back, and glued to the mailing flap by the adhesive strip,

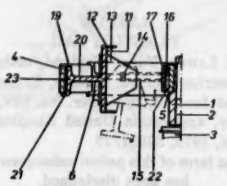
and a fourth section comprising a slide connected with the third section by a tab and folded over the third section and slide relative to the envelope as the mailer is in its completed form as said tab is broken by a pushing or pulling action on the slide, when the mailer reaches its destination, and forming a communication carrying device.

4,093,118

CENTRIFUGE, PARTICULARLY FOR USE WITH AUTOMATIC ANALYSIS APPARATUS, ESPECIALLY FOR CHEMICAL, BIOLOGICAL, OR MEDICAL USE

Hartmut Sinn; Dieter Schroder, and Hans Stallmann, all of Osterode am Harz, Germany, assignors to Heraeus Christ GmbH, Osterode am Harz, Germany

Filed Jun. 2, 1977, Ser. No. 802,372
Claims priority, application Germany, Jun. 16, 1976, 2626910
Int. Cl.² B04B *5/02, 9/12*
U.S. Cl. 233—26 **12 Claims**



1. Centrifuge for substance analysis and for use with essentially flat sample carriers, each of which is adapted to carry a plurality of sample probes, comprising

a rotor having an outer circumferential sleeve (4) of material including at least partly fiber-reinforced plastic;

a pivotably suspended and radially movable holder (11) for said sample carriers so that, when the centrifuge is stopped,

the holders hang downwardly with their outer portion bottommost; and

guide means (15) guiding said holders for radially outward movement toward said outer sleeve (4), said holders (11) being radially outwardly movable toward said outer sleeve, and, in operation of the centrifuge, the holders swinging into horizontal position due to centrifugal force, the outer portion thereof bearing against and being supported by said circumferential sleeve (4) when the holders are forced to pivot from the downward hanging position

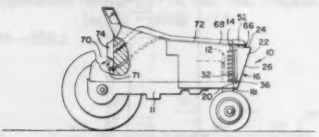
to extend radially outwardly due to centrifugal force arising in operation of the centrifuge.

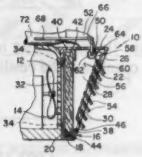
4,093,119

ACCESSORY HEATING DEVICE FOR TRACTORS AND SIMILAR EQUIPMENT

Edmund Swisher, 670 Upper River Rd., Gallipolis, Ohio 45631

Filed May 9, 1977, Ser. No. 794,835
Int. Cl.[2] B60H *3/00, 1/02*
U.S. Cl. 237—12.3 A **6 Claims**





1. An accessory heating device for a tractor and similar equipment mounted onto a forward wall of a radiator housing having a radiator assembly and a fan, which comprises:

(a) a heater housing having a base, a rear wall with a large opening therethrough, a pair of sidewalls, a front wall with a large opening therethrough, a top with a hole therethrough, and a chamber therein, wherein one of said sidewalls has a vertically aligned slotted opening therethrough;

(b) means for mounting said rear wall of said heater housing against said forward wall of said radiator housing;

(c) a filter member insertable through said slotted opening into said chamber;

(d) a plurality of vane elements transversely disposed across said opening of said front wall, each said vane elements rotatably disposed within said opening, said plurality of said vane elements extending from a bottom to a top of said opening;

(e) means for maintaining said filter element in a vertical alignment within said chamber;

(f) means for opening and closing said vane elements within said opening;

(g) an annularly shaped sleeve affixed to an upper surface of said top of said heater housing around said hole in said top; and

(h) one end of a flexible conduit mounted onto said sleeve member, another end of said flexible conduit adapted to be mounted in a serial fluid connection to an air register disposed in an operator's compartment of said tractor.

4,093,120

RAILROAD CROSSING STRUCTURE

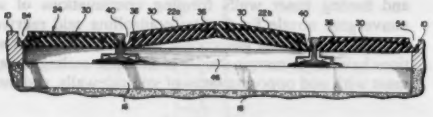
David L. Canfield, Libertyville, Ill., assignor to Park Rubber Company, Lake Zurich, Ill.

Filed Jan. 24, 1977, Ser. No. 761,703
Int. Cl.[2] E01C *9/04*
U.S. Cl. 238—8 **12 Claims**

1. A railroad crossing structure for use with a highway railroad crossing having a pair of spaced, substantially parallel rails, a plurality of elongated ties subtending and supporting said rails and being disposed transversely thereof, and means for securing said rails to said ties, said railroad crossing structure comprising:

(a) an elongated elastomeric pad of a width proportioned to span the distance between said pair of spaced, substantially parallel rails, and having along at least one edge thereof a channel for receiving therein the flange portion of a wheel of a railroad car and for providing a drainage channel for water and the like;

(b) a flexible plate of a generally concave cross-section imbedded within said elastomeric pad, said flexible plate having a deflecting action as vehicles drive over said railroad crossing structure which functions as a shock



absorber to provide a vehicle smoother transition over said railroad crossing structure and to force the edge of said flexible plate towards said channel to break up foreign objects such as snow, ice and the like which may form or collect in said channel; and

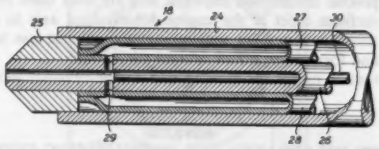
(c) tie down means for securing said elastomeric pad atop said plurality of ties, said tie down means comprising anchor means, the opposite ends of said flexible plate being coupled and secured to the respective ones of said anchor means.

4,093,121

NOZZLE

Torsten Erik Theodor Strom, Fristad, Sweden, assignor to N. Lundbergs Fabriks AB, Fristad, Sweden

Filed Nov. 17, 1976, Ser. No. 742,613
Claims priority, application Sweden, Nov. 18, 1975, 7512927
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—117 **4 Claims**



1. A nozzle for supplying two components for the production of an expanded plastic layer in a cavity defined by a surrounding wall which is being advanced continuously, comprising an outer casing closed at one end, a central nozzle tube arranged coaxially in said casing and extending through the closed end of the casing to form the mouth opening of the nozzle, two supply tubes arranged along diametrically opposed sides of the central tube, which form together with the central tube a partition extending across and longitudinally along the length of the casing, said supply tubes communicating with the central tube near the mouth end thereof, and means for connecting said supply tubes to a supply of their respective components.

4,093,122

INTEGRATED DIVERGENT EXHAUST NOZZLE THRUST REVERSER

Duane L. Linderman, Chula Vista, and Felix Hom, La Mesa, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 3, 1976, Ser. No. 738,578
Int. Cl.[2] B64C *15/06;* **B64D** *33/04*
U.S. Cl. 239—127.3 **15 Claims**

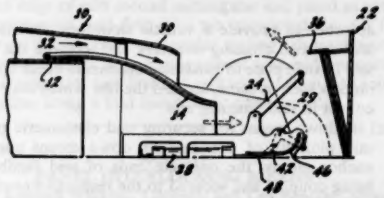
1. An integrated low drag afterbody, divergent nozzle and thrust reverser system for use on high performance aircraft with subsonic cruise and supersonic flight capabilities having

at least one jet engine with a rearwardly discharging nozzle adapted to produce reaction thrust comprising:

a variable divergent nozzle and a low drag afterbody for connection to the aircraft for receiving and controlling rearward flow of the exhaust gas stream from said variable convergent nozzle;

said system comprising at least two fixedly mounted laterally spaced sidewalls having parallel planar opposing faces;

at least two nozzle-reverser sections positioned between said sidewalls with forward and aft pivotal connections thereto and having inner walls forming continuations of said convergent nozzle for further controlling said rearward flow of said exhaust gas stream, said nozzle-reverser sections have outer marginal sides in slideable sealing engagement with said opposing faces of said sidewalls, and move



in a first direction about said forward pivotal connection toward and away from the engine longitudinal axis to vary the cross-sectional area of the divergent nozzle exit through a plurality of intermediate positions from a minimum area cruise position to a maximum divergent reheat augmented thrust position to effect the proper coordination and match with the position of the variable convergent nozzle for substantially optimum expansion of said exhaust gas streams while maintaining a low drag external afterbody and move in a second direction about said aft pivotal connection outward and aft until their rearmost surfaces meet at the engine longitudinal axis to form a thrust reverser for redirecting said exhaust gas laterally and forward to effect reverse thrust; and

actuation means for moving said nozzle-reverser sections.

4,093,123

AIRLESS SPRAYER AND PRESSURIZING SYSTEM

Victor J. Maran, Playa del Rey, Calif., assignor to Dispenser Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 567,307, Apr. 11, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,763

Int. Cl.² B05S *9/047*

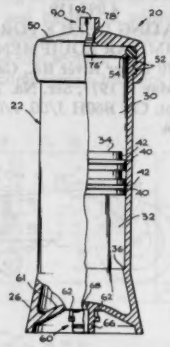
U.S. Cl. 239—322 **16 Claims**

1. A self-contained dispensing unit for dispensing liquid contents under pressure comprising:

a container;

a free-floating piston dividing the container into a first chamber for storing liquid to be dispensed and a second chamber for containing a pressurized gas; and

a manually operable liquid release valve communicating with the first chamber for controllably releasing liquid therefrom under pressure from the second chamber, the valve comprising a valve body with a cylindrical bore having a projecting interior ledge for engaging a resilient sealing member, an insert member receivable through the bore of the valve member and having a cylindrical section of reduced diameter defining an outwardly projecting ledge for engaging a resilient sealing member, the insert member further having an axial bore extending within the cylindrical section and terminating adjacent the outwardly projecting ledge and at least one radial opening extending from the axial bore to outside the cylindrical section, a resilient sealing member mountable on the insert member to seal the cylindrical section to the cylindrical bore of the valve body upon assembly and to releasably seal the radial opening upon engagement between said ledges, and a biasing spring for urging the insert member



ledge toward the projecting interior ledge of the cylindrical bore to compress the resilient sealing member therebetween.

4,093,124

ATOMIZER WITH AIR INLET VALVE

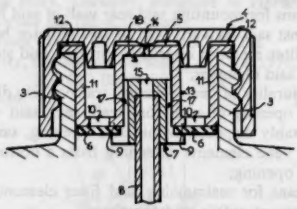
Bruno Morane, Paris; Yves Hardouin, Survilliers, and Jean-Louis Gueret, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 708,367, Jul. 26, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 759,657

Claims priority, application France, Oct. 20, 1976, 76 31523

Int. Cl.² B65D *1/32*

U.S. Cl. 239—327 **19 Claims**



1. In an atomizer for spraying a liquid product, said atomizer comprising a container having flexible walls and a neck, a spray head mounted on said neck, an atomization chamber inside said spray head, a depending tube inside said container opening into said atomization chamber, at least one valveless ejection orifice leading from said chamber to the exterior of said container, and at least one duct connecting the spray chamber to the interior of the container so that the liquid product can be sprayed in atomized form both in an upright and an inverted position of the container, said spray head comprising an annular bottom the edges of which are connected to a peripheral mounting skirt fitted inside said neck and a hollow central shaft encircled by the mounting skirt, said hollow shaft being closed at its upper end by a wall pierced by said at least one ejection orifice, at least one air intake orifice in the annular bottom of the spray head cooperating with a valve member, the improvement according to which the depending tube terminates in a tip seated inside the hollow central shaft and cooperating with said spray head to define said atomization chamber, and the valve member is a flexible washer which covers said at least one air intake orifice when urged thereagainst by pressure within said container, said washer being centered around said tip and gripped between a collar formed

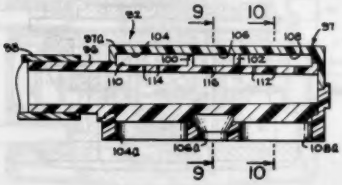
on said tip and the corresponding area on the inner surface of said annular bottom.

4,093,125

WATER NOZZLE FOR DOUGH FORMING APPARATUS

Mounir A. Shatila; William H. VonDerLieth, both of Blackfoot; John L. Veeneman, and Marion E. Thomas, both of Idaho Falls, all of Id., assignors to Ampco Foods, Inc., San Francisco, Calif.

Division of Ser. No. 507,602, Sep. 19, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,529
Int. Cl.[2] B05B *1/14*
U.S. Cl. 239—553.3 5 Claims



1. A nozzle for dispensing water at substantially zero velocity comprising inner and outer elongate hollow cylindric walls, said walls being concentric so that there is defined therebetween a chamber having an annular cross-sectional shape, first and second radially extending impervious discs in said annular chamber, said discs supporting said inner and outer walls in concentric relation and dividing the upper regions of said chamber into a central sub-chamber and two end sub-chambers disposed on opposite longitudinal ends of said central sub-chamber, said end sub-chambers having a substantially larger longitudinal extent than said central sub-chamber, there being a central outlet opening and two end outlet openings communicating with the lower regions of respective said sub-chambers, means for supporting said walls on a substantially horizontal axis, one end of said inner cylindric wall constituting the inlet to said nozzle, the upper region of said inner wall defining a plurality of substantially vertically extending passages for admitting water from interior of said inner cylindric wall to respective said sub-chambers, said outlet openings each having a longitudinal extent corresponding to the respective longitudinal length of said sub-chambers and an area substantially greater than the combined area of said passages so that water egressing from said outlet openings is without significant kinetic energy or velocity except that caused by the force of gravity acting on the water.

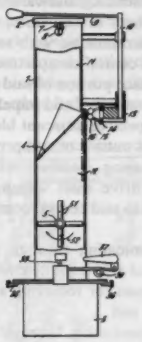
4,093,126

PULVERIZER

Marcel A. Castiaux, rue de Gosselies 58, Roux, Belgium (B-6160)

Filed Apr. 11, 1977, Ser. No. 786,212
Claims priority, application Belgium, Apr. 16, 1976, 0166241
Int. Cl.[2] B02C *13/31, 13/286*
U.S. Cl. 241—37.5 7 Claims

1. A pulveriser for glass containers, comprising a barrel, a lid closing an upper end of said barrel, a flap mounted in said barrel and movable between a closed position and an open position, said flap dividing the interior of said barrel when in a closed position into a first compartment above said flap defining a filling chamber and a second compartment below said flap defining a pulveriser chamber, a pulverising rotor having blades mounted in said second compartment, and a mechanism comprising an arm moveable between a first position in which it locks said lid and another position in which said arm disengages said lid and comprising a cam integral with said arm, said cam having two rolling tracks, a lever pivotally mounted on said barrel adjacent said flap having one end connected to said flap and an opposite end, and a roller attached to said opposite



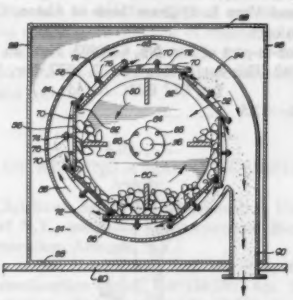
end of said lever engageable successively on said two rolling tracks of said cam.

4,093,127

DISINTEGRATOR AND SEPARATOR APPARATUS

Albert K. Alberts, Bountiful, Utah, and Weldon B. Jolley, Redlands, Calif., assignors to Life Resources Incorporated, Colton, Calif.

Filed Oct. 21, 1975, Ser. No. 624,477
Int. Cl.[2] B02C *23/28*
U.S. Cl. 241—55 3 Claims



1. A device for disintegrating and separating raw materials including in combination:

a processing chamber formed by back and front parallel panels spaced apart from each other and joined together at their outer edges;

an impact wall within said processing chamber displaced inwardly from said outer edges of said panels, to divide said processing chamber into a central compartment with an external compartment including deflection means comprising the longitudinal face portion of a plurality of plates for deflecting material back into the central compartment to achieve inter-partical impacts, including passage means between opposite ends of said plates for connecting said central compartment with said external compartment;

a drive shaft passing through said back panel into said central compartment;

a casing member surrounding said processing chamber to form an insulation space between said casing member and said processing chamber, including bearing means for journaling said drive shaft;

a rotary impeller for accelerating both air and raw material inside said central compartment, and having back and front discs connected by a plurality of transverse blades normal to the direction of rotation of said impeller and

extending between the periphery of said disks, said blades extending inwardly less than half the radial dimension of said disks and extending outwardly without projecting beyond the periphery of said discs, with said drive shaft attached to and terminating with said back disk leaving the middle of said central compartment open and wherein said longitudinal face portion of said plates is aligned with the direction of rotation of said impeller as well as perpendicular to the respective adjacent blades;

motor means located outside of said processing chamber and outside of said casing member, which motor means is attached to said drive shaft which passes through said insulation space into said central compartment for rotating said impeller;

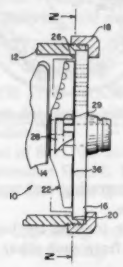
inlet means communicating through said casing member, said front panel and said front disk with said middle of said central compartment for receiving a supply of air and of the raw material; and

outlet means communicating through said casing member with said external compartment for discharging the air along with the disintegrated and separated material.

4,093,128
MEAT EXTRUDER HAVING DOUBLE BLADE CUTTER BAR

J. Haywood Barnes, Wadsworth, Ohio, assignor to Edwin W. Oldham and Vern L. Oldham, both of Akron, Ohio, a part interest to each

Continuation-in-part of Ser. No. 635,403, Nov. 26, 1975, Pat. No. 4,036,442. This application Feb. 7, 1977, Ser. No. 765,920
Int. Cl.[2] B02C *18/36*
U.S. Cl. 241—82.5 **13 Claims**

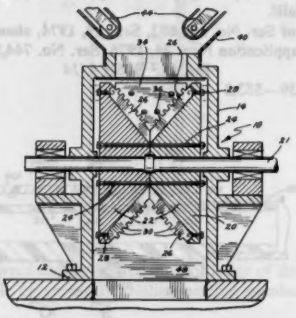


1. In a meat cutting and/or extrusion device including a frame having a tubular portion in which a driven screw extruding means is positioned for forcing meat along the axis of such frame portion, the combination of an apertured discharge means carried by said frame at an end thereof and positioned normal to said axis, a rotatable cutter means secured to said extruding means immediately adjacent said discharge means for cutting the meat into pieces, said discharge means comprising an apertured flat surface disc, said cutter means including a plurality of substantially radially extending cutting blades and a hub portion engaged with an end portion of said screw extruding means, the cutting blades each having an overhanging leading edge connected to a cutting edge of the cutting blades by an inclined surface that aids in moving material being processed towards said discharge means, said cutting blades each having a plurality of radially spaced, substantially circumferentially extending recesses formed in their leading edges.

4,093,129
MACHINE TO COMMINUTE REFUSE

Henry J. Polansky, Buffalo, Minn., assignor to Tire Recycling of Minnesota, Inc., Shoreview, Minn.

Filed Jan. 19, 1977, Ser. No. 760,365
Int. Cl.[2] B02C *13/06*
U.S. Cl. 241—186 R **4 Claims**



1. A machine to comminute refuse includes:

A. a housing;

B. a rotor rotatably mounted in said housing, said rotor being constituted as two integrally connected, face-to-face, outwardly diverging, part-conical discs;

C. a plurality of shear plates extending generally radially outwardly from each of said part-conical discs of said rotor, said shear plates each having a plurality of outwardly extending teeth lying in a radial plane which includes the axis of the rotor and said teeth extending from end to end of the longitudinal dimension of the rotor;

D. power means for causing the rotor to rotate in a first direction;

E. an intake hopper at an upper part of said housing, there being aligned openings provided between a lower portion of the hopper and an upper portion of said housing in position to permit refuse in said intake hopper to pass into said housing;

F. an anvil fixedly positioned in said housing, said anvil having a plurality of teeth situated to intermesh with the shear plate teeth as the shear plates and rotor revolve and rotate in the housing, said anvil teeth extending from end to end of the longitudinal dimension of the rotor, said anvil being below said intake hopper and at a side thereof to receive refuse carried toward it by said shear plate teeth; and

G. said housing being provided with a discharge passageway in position to receive comminuted refuse passing between said rotor and said anvil.

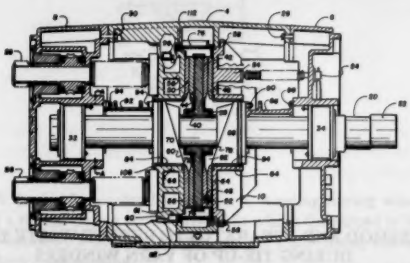
4,093,130
TWIN REFINER APPARATUS

Stanley Robert Prew, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 24, 1977, Ser. No. 780,827
Int. Cl.[2] B02C *7/14*
U.S. Cl. 241—245 **3 Claims**

1. A disc type refiner comprising a base with an integral central housing, a first channel shaped housing attached to one end of the central housing, a second channel shaped housing attached to the other end of the central housing, a drive shaft extending through the first channel shaped housing, the central housing and into the second channel shaped housing, means in the first and second channel shaped housing for rotatably supporting the drive shaft, a non rotating plate holder mounted within a first movable housing located between the central housing and the first channel shaped housing, a second non

rotating plate holder mounted within a second movable housing located between the central housing and the second channel shaped housing, the pair of non rotating plate holders being in spaced opposed relation and having refiner plates disposed on each opposed face of the non rotating plate holders, a rotating disc mounted on the drive shaft between the non rotating refiner plates, refiner plates disposed on each side of the rotating disc in parallel juxtaposed relation to the refiner plates disposed on the opposed non rotating plate holders, means connecting the drive shaft and rotating disc to provide rotation of the disc with the shaft, means for axially adjusting the spacing between the rotating refiner plates and non rotating refiner plates during refining to insure that equal and opposite thrusts are produced on opposite sides of the rotating refiner plates, inlet means for conveying material to be refined into the central housing and directing the material between the juxtaposed refining plates, outlet means for removing the refined material from the central housing, means for changing all refiner plates without moving the rotating center disc, the changing means comprising means for axially retracting the first movable housing with non rotating plate holder and plates away from the rotating center disc and means for axially retracting the second movable housing with non rotating plate holder and plates away fron the rotating center disc.



4,093,131

MACHINE FOR WINDING TAPE BODY INSULATION ON POLE COILS OF ELECTRIC MACHINES

Georgy Semenovich Balyko, ulitsa Sharikovskaya, 47, kv. 37, and Nikolai Stepanovich Bubela, ulitsa Mira, 114, kv. 69, both of Kharkov, U.S.S.R.

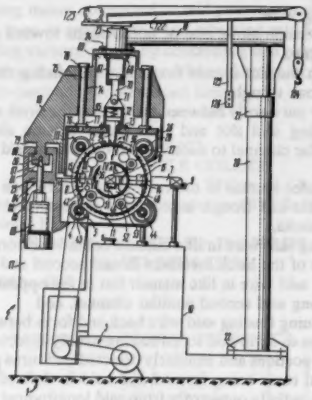
Filed Sep. 15, 1976, Ser. No. 723,651

Claims priority, application U.S.S.R., Dec. 8, 1975, 2198844; Dec. 15, 1975, 2302883; Mar. 15, 1975, 2331578

Int. Cl.[2] H01F *41/12*

U.S. Cl. 242—6 **8 Claims**

1. A machine for winding tape body insulation on the pole coils of electric machines, comprising: a frame mounted on a foundation and consisting of a stationary part and a movable part, the stationary part of the frame being rigidly fixed to the foundation; a support fastened on said stationary part of the frame; an overhang hinged on said support, the movable part of the frame being rigidly fixed to said overhang so as to be movable relative to said stationary part of the frame; an electric drive mounted on the stationary part of the frame; a winding device for applying insulation to a pole coil made in the form of two toothed half-rings detachable from each other, the first of said half-rings being placed on said movable part of the frame, and the second being placed on said stationary part of the frame; a driving gear to drive said winding device, a shaft on which said driving gear is mounted being kinematically interconnected with said electric drive; a unit for holding the pole coil to be wound in position mounted on said stationary part of the frame; a unit for rotation of the pole coil mounted on said stationary part of the frame; a locking device for holding said stationary and movable parts of the frame together while the winding of the insulating tape is in progress, said locking device being placed on one of said parts of the frame and interacting with the other part of the frame; a yoke-shaped traverse mounted on said movable part of the frame and adapted to be displaced thereon; a first pair of rollers mounted on said yoke-shaped traverse, the first toothed half-ring being mounted on said traverse and interacting with said first pair of rollers; a device for locking said first half-ring once the winding of insulating tape on the pole coil is completed, said device being placed on the movable part of the frame; a device for locking said second toothed half-ring upon the completion of winding, said device being placed on the stationary part of the frame; a second pair of rollers mounted on said stationary part of the frame, one roller of said second pair of rollers being mounted on the shaft of said driving gear, said second toothed half-ring being rotatable on said pair of rollers; at least one pin fastened on the face surface of at least one of said toothed half-rings; and a bobbin with insulating tape rotatably mounted on each of said pins.



4,093,132

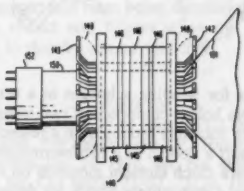
METHOD OF WINDING A MAGNETIC DEFLECTION YOKE

William R. Christiana, Saugerties, and Joseph F. Hevesi, Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 392,847, Aug. 29, 1973, abandoned, which is a continuation of Ser. No. 134,901, Apr. 16, 1971, abandoned, which is a division of Ser. No. 7,275, Jan. 30, 1970, Pat. No. 3,601,731. This application Jul. 18, 1975, Ser. No. 597,266

Int. Cl.[2] H01F *41/08*

U.S. Cl. 242—7.03 **1 Claim**



1. A method of winding a cathode ray tube magnetic deflection yoke with winding end turns produced in situ in defined bundles located radially outwardly from the axial portion of the winding, comprising the steps of:

(a) providing a subassembly comprising an annular core portion and first and second end caps at each end of said core portion forming permanent operative parts of said yoke, said end caps being of non-electrically conductive

non-magnetic material and comprising a plurality of hook members separated by a plurality of slots, said plurality of slots being aligned to form longitudinal troughs along the axis of said core portion and said hooks being radially directed and spaced around the perimeter of said end caps to define corresponding first and second annular channels displaced radially outwardly from said longitudinal troughs,

and using said subassembly as a wire forming and retaining tool by:

(b) feeding wire:

under tension along one of said troughs toward said first end cap,

through the slot in said first end cap defining the end of said one trough,

radially outwardly between and behind the hook members flanking said slot and then under tension along said annular channel to another of the hooks in said first end cap,

then under tension in the reverse axial direction through the slot and trough immediately beyond said other of the hooks,

(c) hooking said wire in like manner behind the corresponding one of the hook members in said second end cap and feeding said wire in like manner but in the opposite direction along said second annular channel, and

(d) continuing feeding said wire back and forth between said end caps to form coil loops having axially directed longitudinal portions and annularly directed end turns portions, said end turns being formed and held in defined bundles located radially outwardly from said longitudinal portions by said annular channels formed by said hook members.

4,093,133

FORMATION OF A RESERVE WINDING THREAD OF DEFINED LENGTH ON BOBBINS OF A TEXTILE MACHINE

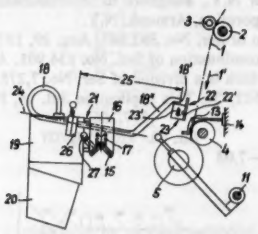
Herbert Hoffmann, Bremen, and Friedrich Wachendorf, Eggestedt, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sep. 15, 1976, Ser. No. 723,492

Claims priority, application Germany, Sep. 20, 1975, 2542000

Int. Cl.[2] B65H *54/02*

U.S. Cl. 242—18 PW **11 Claims**



4. In apparatus for winding a bobbin in a textile machine including: a bobbin holder composed of two arms, two bobbin holding discs each rotatably mounted on a respective arm and arranged to support a bobbin at a predetermined position for rotation, and a yarn catch element mounted on the periphery of one of the discs; a yarn supply device for delivering yarn to a bobbin mounted in the holder; a yarn collector; and a suction device having an outlet end connected to the yarn collector and an inlet opening in the vicinity of the location in which a bobbin is supported by the holder, the suction device having an inlet region extending from the inlet opening toward the outlet end, the improvement comprising:

a guide member and a yarn severing device carried by said suction device in the vicinity of its said inlet opening;

means supporting said inlet region for pivotal movement between a first position in which the inlet opening is in front of the bobbin position and a second position which is located at the opposite side of the bobbin position from said yarn supply device;

a yarn cutting device located in said suction device at a variable distance from said inlet opening for cutting yarn in said suction device at a selected distance from said inlet opening;

and cutting control means connected to said cutting device for causing it to cut the yarn at such preselected distance from said inlet opening in response to movement of said inlet region of said suction device to said second position.

4,093,134

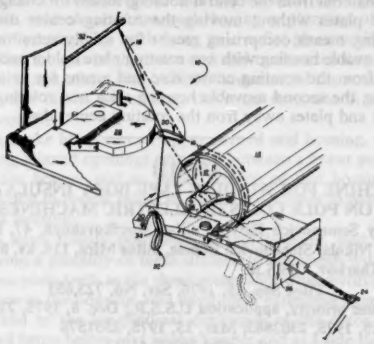
METHOD AND APPARATUS TO REDUCE WASTE YARN DURING TIE-UP OF YARN WINDERS

Alfons F. Schmitz, and Douglas L. Dixon, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1977, Ser. No. 799,796

Int. Cl.[2] B65H *54/02*

U.S. Cl. 242—18 PW **8 Claims**



1. In a yarn winder having

a mandrel for rotatably supporting a yarn package tube that has in the outer axial end of the yarn package tube a notch for snagging a yarn moving from a source of supply and into an air doffer, and

a transfer tail apparatus for guiding the moving yarn into engagement with the outer axial end of a rotating supported yarn package tube for subsequent snagging of the yarn by the notch and severing of the yarn between the notch and in or near the air doffer and subsequent formation on the yarn package tube of a yarn transfer tail prior to release of the moving yarn from the transfer tail apparatus to a yarn traverse guide on the yarn winder for guiding of the yarn onto the package portion of the yarn package tube as the yarn package tube rotates, the improvement comprising:

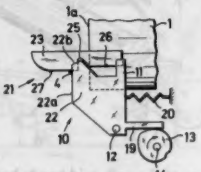
means on the mandrel operative upon the yarn becoming snagged in the notch and severed for trapping the loose portion of the severed yarn that extends between the notch where the moving yarn becomes snagged and a point in or near the air doffer where the yarn becomes severed.

4,093,135

DEVICE FOR CONTROLLING A RESERVE WINDING WHEN WINDING THREAD ON A SPOOL OR CORE

Peter Hermanns, Stommeln, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Jan. 26, 1976, Ser. No. 652,337
Claims priority, application Germany, Jan. 28, 1975, 2503299
Int. Cl.[2] B65H *54/02, 54/34*
U.S. Cl. 242—18 PW 18 Claims



1. A device for controlling a reserve winding during winding of a thread onto a spool or core, in which the thread is fed to the spool by a delivery mechanism via a traversing device, said device comprising:

a. means for applying an end of the thread to the spool at an intermediate point approximately midway of the length of a reserve winding zone defined adjacent the end of the spool,

b. means for moving the thread in a to-and-fro movement first in an outward axial direction toward the end of the spool to fix said thread end by a plurality of crossing thread windings forming a first layer of windings and then in an inward axial direction away from the end of the spool to form a plurality of reserve windings over the first layer of windings,

c. means for maintaining the speed of the to-and-fro movement of the thread within the reserve winding zone at a predetermined amount,

d. said moving means includes a stationary member having a straight edge portion and a movably disposed thread guide contact means, and

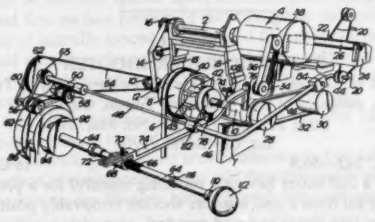
e. said thread guide contact means being effective to cause the thread to move to-and-fro along the straight edge portion.

4,093,136

TEXTILE, YARN OR TAPE WINDING MACHINES

Gordon Mackie, Ladyhill, Ireland, assignor to James Mackie & Sons Limited, Belfast, Ireland

Filed May 27, 1976, Ser. No. 690,746
Claims priority, application United Kingdom, Jun. 2, 1975, 23800/75
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—45 8 Claims



1. A yarn or tape winding machine comprising:

a take up spindle for winding said yarn or tape,

drive means for rotating a member at a controlled speed,

torque transmitting variator means including said member for transmitting a controlled torque to said take up spindle,

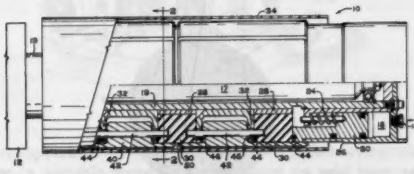
control means for controlling the torque transmitted by said torque transmitting variator means, said control means including a second member connected to said torque transmitting variator means, power means connected to said second member for driving said second member, and sensing means connected to said power means for sensing said yarn or tape tension and adjusting said torque transmitting variator means by controlling said power means to move said second member when said yarn or tape tension varies beyond predetermined limits.

4,093,137

EXPANDABLE COLLET

Thomas J. Briar, Trafford, and Walter J. Reese, North Huntington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 19, 1977, Ser. No. 798,555
Int. Cl.[2] B65H *75/24*
U.S. Cl. 242—46.4 6 Claims



1. In a collet for collecting strand material on a tube comprising:

a fluid inlet, a sealed fluid chamber, a piston, a plurality of expandable rings, a plurality of unexpandable spacers between said rings and at the end of said rings opposite said piston, a shaft slideably carrying said piston, rings, and spacers and means for rotating said collet, said piston, rings, and spacers being arranged such that upon passing a fluid into said chamber and pressurizing said chamber said pressure is transferred by said piston and said spacers to said rings to expand said rings and upon release of said fluid pressure said piston and said spacers release the pressure from said expandable rings to return said rings to their unexpanded state, the improvement comprising a plurality of fingers surrounding said rings and spacers and means connecting said fingers to said rings, said fingers being capable of firmly holding said tube in place during winding of said strand material and said means connecting said fingers to said rings being capable of acting with said rings to retract said fingers when the fluid pressure is released to thereby release said tube.

4,093,138

PORTABLE HOLDER FOR RIBBON-LIKE MATERIAL

Robert E. Shafer, 185 Shady Lake Dr., Hurst, Tex. 76053

Filed Jun. 14, 1976, Ser. No. 696,122
Int. Cl.[2] B65H *75/02, 75/26, 19/02*
U.S. Cl. 242—55.2 5 Claims

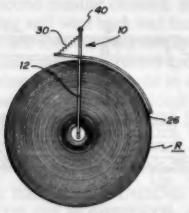
1. Portable apparatus for holding and dispensing a coiled strip of ribbon-like material, with the initial radius of a full coil having a given size which is substantially larger than the width of said coiled material, comprising:

(a) a pair of parallel rods rigidly connected at the first ends thereof, with the length of said rods being substantially longer than the radius of a full coil of the strip of ribbon-like material, and the separation of the pair of rods being only slightly greater than the width of the ribbon-like

material, such that the rods serve to restrain the sides of the coil of material against movement in an axial direction;

(b) an arm pivotably connected to the pair of parallel rods at a point intermediate the length of said arm and relatively near one end thereof, so as to divide the arm into longer and shorter portions, with the arm being mounted between the pair of rods, and the pivot location on said pair of rods being relatively near their rigidly connected ends, and the longer portion of the arm being curved inwardly to the extent that its distal end lies near the periphery of a coil of the ribbon-like material when said coil is mounted in the apparatus, and the distal end of said longer portion of the pivoted arm defining an arc as the material is progressively removed from the coil at the periphery thereof, and the length of said longer arm portion is such as to cause said arc to extend approximately through the center of the coiled material;

(c) means for releasably and rotatably holding a coil of ribbon-like material between the two parallel rods, with said means including a rigid core having a diameter of at least two inches and being so thin as to permit the parallel rods to bear directly against the sides of the coiled mate-



rial, and further including a removable fastener for holding the rigid core between the second ends of the two parallel rods, such that the apparatus may be rotated about any axis and turned through any angle without causing the coil of ribbon-like material to fall out of the apparatus;

(d) a spring mounted for biasing the arm toward general longitudinal alignment with the two parallel rods; and

(e) a generally U-shaped foot secured to the dital end of the longer portion of the pivoted arm, with the open part of the foot being oriented inwardly toward the rods, and the gap between the two legs of the U-shaped foot being just slightly wider than the width of the coiled material, such that the U-shaped foot can both encompass and bear radially against a peripheral portion of the coil of ribbon-like material which is held between the two parallel rods, and the length of the two legs of the U-shaped foot being substantially less than the radius of the rigid core, whereby interference between the two rods and a projecting leg of the U-shaped foot is precluded, and the base of said foot will therefore press radially against the periphery of the coiled material until the very last increment of said material is dispensed from the apparatus.

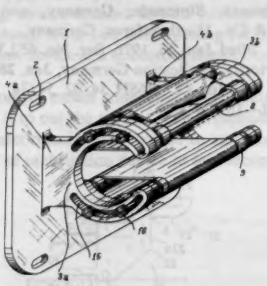
4,093,139

SUPPORT FOR LONG ROLLS OF SHEET MATERIAL

Alfred P. Amoretti, 5 ruelle St. Roch, Nice, France

Filed Jan. 5, 1977, Ser. No. 756,860
Int. Cl.² B65H *75/12*
U.S. Cl. 242—55.2 **8 Claims**

1. A support for a roll of sheet material having a base, comprising an upper series of rollers and a lower series of rollers, an upper endless band of flexible elastic material disposed about said upper rollers, and a lower endless flexible band of elastic material disposed about said lower rollers, said support being adapted to receive a roll of sheet material between said bands with said bands in contact with upper and lower por-



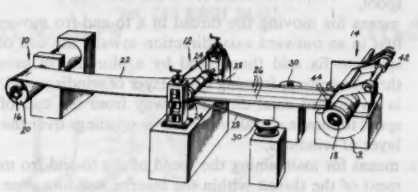
tions of the periphery of the roll, said bands being driven by the roll of sheet material upon rotation of the roll of sheet material.

4,093,140

METHOD OF RECOILING SLIT MATERIAL

Douglas S. Matsunaga, Chicago, Ill., assignor to Braner Enterprises, Inc., Schiller Park, Ill.

Filed Feb. 22, 1977, Ser. No. 770,804
Int. Cl.² B65H *35/02, 23/10*
U.S. Cl. 242—56.2 **4 Claims**



1. In a slitting line including an uncoiler, a slitter and a recoiler having a rotatable drum, a coil of metal material carried by said uncoiler, said material extending through said slitter and being cut thereby into multile strands, and strands varying in thickness, the method of coiling said strands comprising the steps:

(a) securing the ends of each strand to said recoiler drum;

(b) rotating said recoiler drum to coil at least one turn of each strand around said drum;

(c) releasing the end of each strand from said drum with said first turns of the strands remaining in contact with the drum; and

(d) rotating said drum in frictional contact with said strand first turns to impart winding rotation to the strands with said drum rotating relative to at least one of said strands to cause each of the strands to be wound upon said drum at substantially the same linear speed as said sheet material is uncoiled during rotation of said uncoiler and passes through said slitter.

4,093,141

RECOILER SPACER SHOOTER

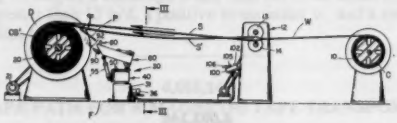
Richard H. Garrett, Sr., and Yale M. Feniger, both of Toledo, Ohio, assignors to Coil Tite, Inc., Toledo, Ohio

Filed Jun. 2, 1977, Ser. No. 802,721
Int. Cl.² B65H *19/04*
U.S. Cl. 242—56.9 **16 Claims**

1. In a coil slitter having a recoiling mandrel for a plurality of strips slit from a coil, a spacer shooter removably positioned between said slitter and said mandrel, comprising:

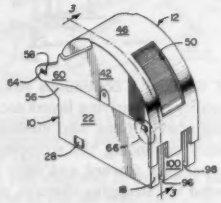
(A) a vertical post-type base located before said mandrel and adjacent one side of the plurality of strips slit from the coil,

(B) a horizontal boom extending from said base under said strips,
(C) means for oscillating said boom on said post base to a position away from under said strips,
(D) carriage means movable on and along said boom,
(E) means for moving said carriage along said boom,
(F) a spacer shooter device pivotally mounting on said carriage,
(G) means for raising and lowering said device about its pivot to direct its free end toward said winding coil on said mandrel,



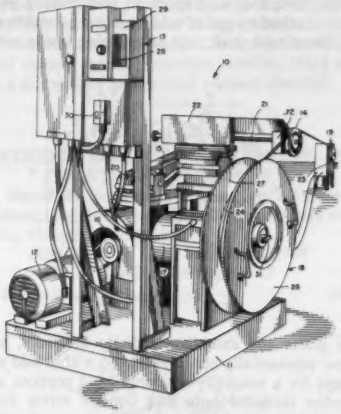
(H) beam means projecting outwardly from said device for indicating the coil strip and its periphery toward which said device is aimed,
(I) storage means for a plurality of spacers in said device, and
(J) means for shooting one spacer at a time from said storage means out of said device in the direction of said beam for insertion in the coil of the selected winding strip for taking up the slack in said strip between the slitter and the mandrel.

4,093,142
FILMSTRIP CARTRIDGE
Marvin I. Mindell, Pittsford, N.Y., assignor to The Singer Company, New York, N.Y.
Filed Sep. 20, 1976, Ser. No. 724,875
Int. Cl.[2] G03B *23/02*
U.S. Cl. 242—71.1 **24 Claims**



1. An improved filmstrip cartridge comprising:
a filmstrip cartridge having a film guide channel:
whereby filmstrip may be guided along its longitudinal axis into and out of said filmstrip cartridge;
said film guide channel terminating with a film opening through which said filmstrip may be guided along its longitudinal axis into and out of said filmstrip cartridge;
said film guide channel having a first surface portion opposite a second surface portion;
a pair of laterally spaced apart first film guide surfaces on said first surface portion of said film guide channel;
a pair of laterally spaced apart second film guide surfaces on said second surface portion of said film guide channel;
said first and said second film guide surfaces providing support for the lateral margins of said filmstrip; and
the space between said second film guide surfaces having a finger opening formed therein and
means providing a reduced area of film contact on said first surface in the space between said first film guide surfaces to reduce the friction between said film and said first surface;
said reduced area of film contact in registration with said opening;
whereby said filmstrip may be manually advanced along said film guide channel by pushing said filmstrip accessible through said finger opening with a finger.

4,093,143
STOCK WINDING APPARATUS
Jesse W. Escue, 314 Nicholson, Joliet, Ill. 60435
Filed Apr. 11, 1977, Ser. No. 786,149
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—75.51 **15 Claims**

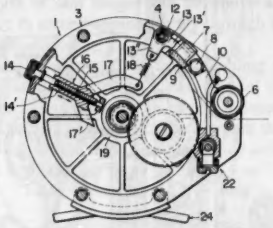


1. An apparatus for winding stock in coil fashion comprising a base, a variable speed motor mounted on said base, said motor operatively joined through a first gear box to a drive shaft equipped with a reel for taking up said stock, a speed selection control unit for regulating the speed of said motor having monitoring means responsive to movement of said stock at a point remote from said reel, said monitoring means instantaneously signalling said motor to reduce its speed in response to momentary slight increases in the speed of said stock at said remote point as the diameter of said stock on said reel builds to maintain the speed of said stock at the selected speed on said control unit, a coil guide operatively joined through a second gear box to said first gear box for rotation and reciprocation to direct said stock onto said reel, said coil guide being carried on a support shaft linked to said second gear box through reciprocal camming means, and clutch means for selectively engaging and disengaging said motor and said first gear box whereby said apparatus is adapted to direct said stock onto said reel in side-by-side coil fashion at the selected speed.

4,093,144
FISHING REEL BRAKE
Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Fuchu, Japan
Filed Aug. 25, 1976, Ser. No. 717,782
Claims priority, application Japan, Aug. 29, 1975, 50-120020[U]
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—84.52 A **1 Claim**

1. In a bearing type fishing reel having a reel body with side plates rotatably supporting a spool around which a fishing line is controllably wound and unwound through a traverse cam device, the improvement characterized by,
a shaft extending between said side plates and positioned radially outwardly from said spool, a pair of arms pivotally mounted at one end to said shaft, said arms extending substantially along the outer circumference of said spool when in a braking position and rotatable away from the outer circumference of said spool to a non-braking posi-

tion, a line guide roller rotatably connected between second ends of said arms at a position whereby said line will ride on said guide roller as said line is unwound or rewound, and said guide roller being positioned such that tension on said line provides a rotating force on said arms in the direction of said non-braking position, said arms having brake pads connected thereto at positions closer to said shaft than said roller and on the side of said arms facing said spool to frictionally engage said outer circumference of said spool, the force of said frictional engagement being greater as said arms are rotated towards the circumference of said spool to said braking position, a lever attached to one of said arms and rotatable with said arm about said shaft, said lever being inside one of said



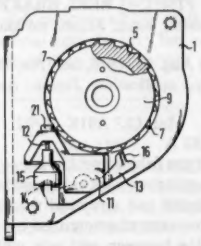
side plates and extending radially inwardly, a control screw substantially entirely located within said side plate except for a manually rotatable head portion, a control member threaded onto said control screw for sliding axially thereon upon rotation of said screw, said control member having an arm extending towards said lever, spring means connected between said control member arm and said radially extending lever, said spring means and the weight of said line guide roller providing a biasing force on said arms to rotate said arms to said braking position, whereby the value of said braking force can be manually adjusted by rotating said control screw which causes the physical relationship between said spring means and radially extending lever to be altered.

4,093,145

SELF-LOCKING BELT WINDING DEVICE

Wolf-Dieter Klink, Schw.-Gmund-Lindach, Germany, assignor to REPA GmbH Feinstanzwerk, Schw.-Gmund-Lindach, Germany

Filed Dec. 17, 1973, Ser. No. 426,341
Claims priority, application Germany, Dec. 18, 1972, 2261890
The portion of the term of this patent subsequent to Jun. 6, 1993, has been disclaimed.
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



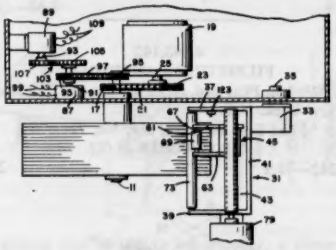
1. Self-locking belt wind-up device for safety belts comprising rotatable cylinder means whereon a safety belt is windable, and a unitary assembly of a bearing block, a pendulum pendulously supported by said bearing block, and a locking lever pivotally supported independently of said pendulum on said bearing block, said pendulum having a mass on the normally lower end thereof, said locking lever being engageable by said mass and being pivotable thereby into a position wherein it is in engagement with said cylinder means and locks the latter against rotation.

4,093,146

WINDING METHOD AND APPARATUS FOR STRAPPING AND STRAPPING PACKAGE

Harold A. Haley, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 561,133, Mar. 24, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,432
Int. Cl.[2] B65H *54/28, 55/04*
U.S. Cl. 242—158.2 **22 Claims**



1. A method of winding a continuous strapping as a roll comprised of a plurality of overlying layers each having a like number of strapping convolutions, said method including the steps of continuously advancing the strapping relative to a strapping traverse carriage toward and onto a continuously rotating shaft to wind the strapping thereon, moving the carriage linearly like distances in each of opposite directions relative and parallel to the rotating shaft and correlating the movement of the traverse carriage with the rotation of the winding shaft by generating a like number of electrical pulses during each revolution of the winding shaft, employing a train of electrical pulses related to those generated during rotation of the winding shaft for moving the carriage in each of its opposite directions of traverse for a period during which I + F convolutions of strapping are wound about the shaft as a roll layer, where I is an interger and F ranges from zero to less than one complete convolution, and between successive movements of the carriage in the opposite directions of traverse maintaining the carriage in a dwell position for a period during which a selected number of such electrical pulses are generated by the rotation of the winding shaft and strapping portions B are wound on the roll which bridge overlying roll layers and define nodes at each of the roll ends, with the duration of each such dwell period being such that the strapping portions F and B together range essentially 1 minus ¼ of a strapping convolution to 1 plus ¼ strapping convolutions and the nodes defined by the bridging portions B at the respective ends of the wound roll are arranged in overlying relationships and form not less than 2 and not more than 4 groups of nodes at each of such roll ends.

4,093,147

FLAT NYLON 66 YARN HAVING A SOFT HAND, AND PROCESS FOR MAKING SAME

James E. Bromley, Pensacola, Fla.; Michael M. McNamara, Gaffney, S.C., and Wayne T. Mowe, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 482,962, Jun. 25, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,721
Int. Cl.[2] B65H *55/02;* D01D *5/16;* D02J *1/22;* D02G *3/22*
U.S. Cl. 242—159 22 Claims

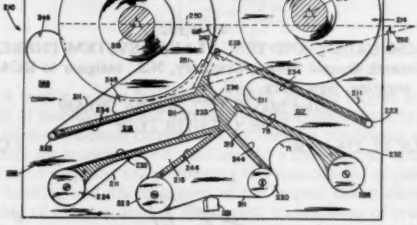
1. A bobbin having wound thereon a flat nylon 66 yarn having a substantially constant cross sectional configuration along its length, a shrinkage S less than 8.5%, an initial modulus greater than 15 g/d, a positive stress index α, and a retraction less than 1%.

4,093,148

TAPE PATH FOR A MAGNETIC TAPE TRANSPORT SYSTEM

James P. Urynowicz, Los Angeles; Daniel R. O'Neill, Santa Monica; Hale M. Jones, Playa Del Rey, and Alan Painter, Los Angeles, all of Calif., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed Nov. 5, 1975, Ser. No. 623,469
Int. Cl.[2] G11B *15/58*
U.S. Cl. 242—182 3 Claims



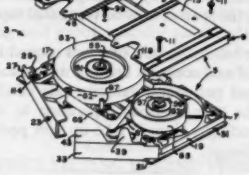
1. Within a magnetic tape transport system, which includes:
a. a file reel disposed in a particular plane, the file reel storing a magnetic tape;
b. a machine reel disposed in the same plane as the file reel and adjacent to the file reel;
c. a file reel drive motor for driving the file reel;
d. a machine reel drive motor for driving the machine reel;
e. a magnetic head disposed approximately on a center-line drawn between the file reel and the machine reel;
f. a capstan for driving the magnetic tape bidirectionally between the file reel and the machine reel;
g. a control system for controlling the file reel drive motor, the machine reel drive motor and the capstan, a tape path comprising:
1. a first vacuum chamber and a second vacuum chamber, each of said vacuum chambers being disposed in the same plane as the file reel and the machine reel and having a front plate, a back plate, a base plate and a pair of parallel sidewalls, one sidewall of said first vacuum chamber is adjacent to the file reel and one sidewall of the second vacuum chamber; is adjacent to the machine reel, said first and second vacuum chambers being disposed in such a manner that said parallel sidewall plates of said first vacuum chamber form a V with said parallel sidewall plates of said second vacuum chamber with both of said base plates at the vertex of said V, said first vacuum chamber is disposed parallel and adjacent to a line tangent to said file reel, said tangent line intersecting the horizontal line of said file reel at an angle in the range of 10° to 20° and said second vacuum chamber is disposed perpendicular and adjacent to a line tangent to said file reel, said tangent line intersecting the horizontal line of said file reel at an angle in the range of 60° to 70°, the horizontal line being drawn through the center of said file reel and parallel to the ground;
2. means for guiding said magnetic tape along said tape path; and
3. a first auxiliary vacuum chamber and a second auxiliary vacuum chamber, each of said auxiliary vacuum chambers disposed adjacent to one of said first and second vacuum chambers and having a front plate, a back plate, a pair of sidewall plates, one sidewall plate of said first auxiliary vacuum chamber being common to a sidewall of said first vacuum chamber and one sidewall plate of said second auxiliary vacuum chamber being common to a sidewall of said second vacuum chamber.

4,093,149

CARTRIDGE TAPE RECORDER SYSTEM AND CARTRIDGE THEREFOR

Bansi K. Shroff, Irvine; Frank Dekker, Santa Ana, and John Nordrehaug, Laguna Niguel, all of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 28, 1975, Ser. No. 635,939
Int. Cl.[2] G11B *23/10, 15/32*
U.S. Cl. 242—198 14 Claims



1. A cartridge-type tape transport system comprising in combination: (A) a cartridge enclosing a pair of coplanar hubs rotatable about fixed axes orthogonal to the plane of said hubs and a length of pliable tape carried in rolls on said hubs, with a span of said tape intermediate said rolls extending generally across a front face of said cartridge and (B) a transport comprising (1) a transducer cooperative with said span of tape intermediate said rolls, and (2) drive means for driving said tape across said transducer onto a first said tape roll from the second said tape roll, characterized by positioning means for positioning said cartridge along said orthogonal axes with respect to said transducer, said positioning means comprising: (i) a plurality of slots on a broad face of said cartridge, said slots extending from front to rear of said face, (ii) a plurality of ribs on said transport, said ribs extending into said slots and engaging the bottom surfaces of said slots to establish the position along said orthogonal axes of said cartridge, said ribs having a height greater than the depth of said slots and (iii) cartridge biasing means for biasing the bottom surfaces of said slots into engagement with said ribs.

4,093,150

METHOD AND APPARATUS FOR PROVIDING CONSTANT MAGNETIC TAPE TENSION

Donald L. Burdorf, Newport Beach, and James Bjordahl, Arcadia, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 13, 1977, Ser. No. 805,654
Int. Cl.[2] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—192 14 Claims

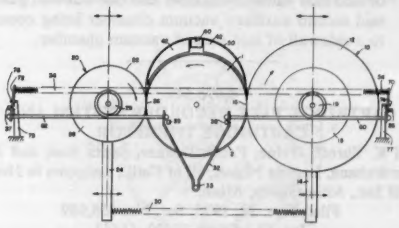
1. An apparatus for generating constant tape tension in a tape

transport system of the type wherein the supply and take-up reels are simultaneously driven by surface engagement with a capstan having a resiliently deformable peripheral surface, said apparatus comprising:

means for urging the supply and take-up reels against the peripheral surface of the capstan thereby causing the peripheral velocity of said supply and take-up reels to increase above that of said capstan;

means for imparting a constant braking force on said supply reel, said braking means generating bias and torque effects upon the periphery of said supply reel;

said bias effect uniformly reducing the peripheral velocity of the supply reel throughout the tape transport operation



thereby creating a first tensioning component in the span of tape between said supply and take-up reels;

said torque effect reducing the peripheral velocity of the supply reel throughout the tape transport operation in direct proportion to the decreasing diameter of the tape wound thereon thereby creating a second tensioning component in the span of tape between said supply and take-up reels; and

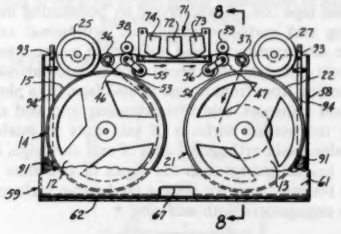
a means for balancing said first and second tensioning components of said constant braking means so as to match the supply reel peripheral velocity rate of change occuring during the tape transport operation to the greater, but correspondingly sloped, take-up reel peripheral velocity rate of change.

4,093,151

WEB TRANSPORTING APPARATUS AND WEB CARTRIDGES

Irving Karsh, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,739
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—198 **20 Claims**



1. Apparatus for transporting a web from a first reel to a distinct second reel, comprising in combination:

means for rotating said first reel including a first turntable structure for removably receiving, supporting and rotating said first reel, and first means for engaging a peripheral portion of said first turntable structure and for rotating said first turntable structure via said peripheral portion;

means for rotating said second reel including a distinct second turntable structure for removably receiving, supporting and rotating said second reel, and second means for engaging a peripheral portion of said second turntable structure and for rotating said second turntable structure via said peripheral portion of the second turntable structure;

means including a web capstan for driving said web between said first and second reels;

a base for jointly supporting and rotatably mounting said first and second turntable structures;

means for forming a first web loop between said first turntable structure and said web capstan, said first loop forming means including a first web loop feeler, means for yieldably mounting said first web loop feeler on said base adjacent said first turntable structure, and first means releasably coupled to said first web loop feeler and connected to said first turntable rotating means for controlling said first turntable rotating means to maintain said first web loop;

means for forming a second web loop between said second turntable structure and said web capstan, said second loop forming means including a second web loop feeler, means for yieldably mounting said second web loop feeler on said base adjacent said second turntable structure, and second means releasably coupled to said second web loop feeler and connected to said second turntable rotating means for controlling said second turntable rotating means to maintain said second web loop; and

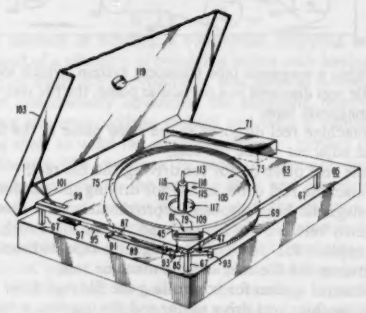
means for mounting said base for manual removal relative to said first and second peripheral portion engaging means, web capstan and first and second means for controlling said first and second turntable rotating means.

4,093,152

DISC CADDY AND DISC PLAYER SYSTEM THEREFOR

Kenneth Donald Peters, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,639
Int. Cl.[2] G11B *25/04*
U.S. Cl. 274—9 R **6 Claims**



1. In a disc record player, including a turntable rotatably mounted on a base, for use with a record-enclosing caddy having a pair of substantially flat covers, with peripheries releasably held by an expandable ring in respective channels in the inner rim of said ring which are disposed on opposite sides of an inwardly-projecting central land of the ring; apparatus comprising the combination:

means, mounted on said base and including a ring-engaging platform, for supporting a caddy in a position over said turntable whereat the covers thereof are substantially parallel to said turntable;

first selectively actuated means for expanding the circumference of a platform-engaged caddy ring to an expanded shape permitting channel release of the lowermost of the covers held by said platform-engaged ring, while main-

taining support of the uppermost of said covers on the central land of said ring; and

second selectively actuated means, subject to engagement with the released cover, for lifting said released cover off said turntable and returning it to plaftform level.

4,093,153

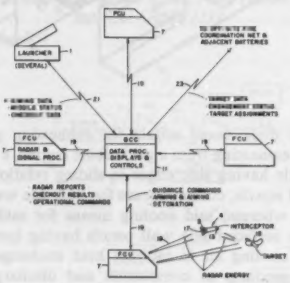
GROUND-CONTROLLED GUIDED-MISSILE SYSTEM

Manuel L. Bardash, Willingboro; Carl P. Clasen, Cherry Hill; Robert M. Scudder, Haddonfield; Lawrence H. Simon, Cherry Hill; Charles S. Sorkin, Cherry Hill; Raphael O. Yavne, Cherry Hill, all of N.J.; Robert W. Ekis, Athens, Ala., and Alfred I. Mintzer, Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1965, Ser. No. 508,605

Int. Cl.[2] F41G *7/14*

U.S. Cl. 244—3.14 **17 Claims**



1. A missile system for defense against ground targets and clouds of incoming targets and decoys, comprising: launchers with missiles mounted thereon and disposed for positioning on locations for launching said missiles; and a time-sharing radar installation disposed for performing the functions of acquisition, tracking and discrimination of the targets, simultaneous tracking of discrete units of the targets, transmission of command signals to said launchers for launching said missiles, and command control of said missiles after the launch, all on the same time-sharing basis.

4,093,154

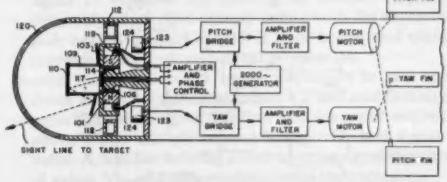
TARGET SEEKING GYRO FOR A MISSILE

William B. McLean, China Lake, Calif., assignor to Walter G. Finch, Baltimore, Md., a part interest

Continuation of Ser. No. 337,899, Feb. 19, 1953, abandoned. This application May 7, 1956, Ser. No. 583,337

Int. Cl.[2] F42B *13/28*; F41G *7/10*; G01C *19/28, 19/53*

U.S. Cl. 244—3.16 **38 Claims**



37. In combination in a missile guidance system, a target seeking apparatus having radiation responsive means including a scanner, a gyroscope having a rotor, said scanner being mounted on said rotor for picking up radiation from a target, means for precessing said gyroscope rotor to align its axis with the sight line to said target, said radiation responsive means producing a signal when the gyroscope rotor axis deviates from alignment with the sight line to said target, said signal having a time phase dependent on the radial direction of departure of said target from the gyro rotor axis, the precessing means embodying mechanism responsive to the phase of said signal whereby said gyro is precessed in the proper sense to align its axis with the line of sight to said target, a position sensing means included in said target seeking apparatus and mounted adjacent said gyro rotor for sensing the position of said gyro rotor, and servo means responsive to signals from said gyro rotor position sensing means for guiding said missile.

38. A target seeking device for a guided missile comprising a gyroscopically stabilized means for optically scanning a limited region about a first coordinate axis for electromagnetic radiations emanating from a target source, said means including a permanent magnet rotor rotatable with said gyroscopic means about said first axis, the magnetic poles of said permanent magnet defining a second coordinate axis transverse to said first coordinate axis, a radiation sensitive means for producing electrical signal variations in response to variations in radiation incident on said radiation sensitive means, said radiation sensitive means being fixedly positioned relative to said scanning means for receiving said radiations from said scanning means to cause said electrical signals generated thereby to vary in magnitude with the directional displacement of said target with respect to said first coordinate axis and in time phase with the polar angular position of said target with respect to the second coordinate axis, and means interacting with said permanent magnet rotor responsive to said signal for applying a magnetic force to said gyroscopically stabilized means having a component normal to said second axis and in a direction causing said gyroscopically stabilized means to precess through an angle and in a direction to bring said first coordinate axis into directional alignment with said target source.

4,093,155

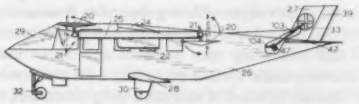
STEAM POWERED TILTING ENGINE VTOL AIRPLANE

Elmo Kincaid, Jr., 1660 Ashley Dr., Clarkston, Wash. 99403

Filed Feb. 14, 1977, Ser. No. 770,086

Int. Cl.[2] B64C *29/00*

U.S. Cl. 244—12.4 **10 Claims**



1. A VTOL airplane having fixed wings with a plurality of propulsion units supported on struts distributed about the center of gravity of the airplane, and having multi-bladed rotors interconnected to and driven by each propulsion unit in a manner for generating thrust when the propulsion units are operated, the propulsion units being mounted rotatably to the wings of the airplane for movement between forward flight positions and hover positions, including means for rotating said propulsion units between the forward flight position and the hover position, at least one working fluid generator fixedly attached to the airplane, and means for distributing the working fluid from the said generator to each of the propulsion units, each propulsion unit comprising:

(a) two cylinders horizontally opposed, said cylinders being mounted on opposite sides of a crankcase,

(b) a plurality of bosses surrounding said crankcase,

(c) radial bearings received by said bosses, to surround and support the propulsion unit, said bearings having an axis of rotation substantially parallel to said cylinders, and

(d) each of said cylinders having a cylinder head and a

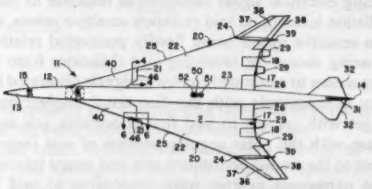
working fluid supply pipe connected thereto by means of a rotary joint which is coaxial with said radial bearings.

4,093,156

SUPERSONIC TRANSPORT

Paul L. Coe, Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 27, 1976, Ser. No. 718,244
Int. Cl.[2] B64C *3/08, 5/04*
U.S. Cl. 244—45 A **5 Claims**



1. An aircraft having supersonic flight capabilities comprising:

a fuselage having a fineness ratio suitable for supersonic flight;

a wing connected to each side of said fuselage and projecting outwardly therefrom, each said wing including:

(a) a main wing panel having a relatively thick swept leading edge and a relatively thin trailing edge, said main wing panel having notched leading edge means for receiving a movable wing apex segment in its stowed position;

the wing apex segment forming a forward extension of the swept leading edge of said main wing panel in the stowed position for efficient supersonic cruise, said wing apex segment being separable from said wing and both pivotal and rotatable to a deployed position such that said wing apex segment acts as an independent aerodynamic surface providing a lift component to said aircraft forward of said main wing panel, said wing apex segment being further segmented into members to obtain desired sectional configurations; the wing apex segment providing a substantially linear variation in aircraft pitching moment with respect to aircraft angle of attack by suppressing the formation of wing apex vertices when the wing apex is in a deployed position;

at least one engine nacelle affixed beneath each said wing and terminating substantially at the trailing edge thereof; an engine contained in each said nacelle for producing thrust; and jet exit nozzles hingedly attached to substantially the rearmost extremity of each said nacelle so constructed and arranged as to direct thrust;

means for selectively positioning said jet exit nozzles such that their angle of declination increases the positive lift component of the thrust vector during reductions in flight speed from supersonic to subsonic; and

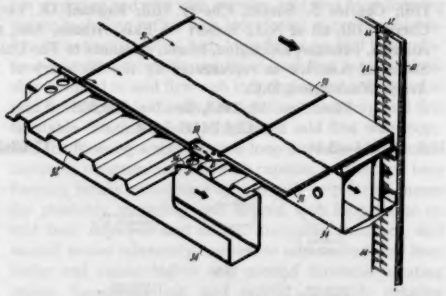
means for selectively positioning said wing apex segments and segmented members so that their angle of incidence produces a variable forward lift component providing artificial longitudinal stability to said aircraft in its initial trim condition.

4,093,157

SEAL FOR VARIABLE PLUG TWO DIMENSIONAL NOZZLE

Robert B. Cavanagh, Jr., and David K. Jan, both of Rockville, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 751,802, Dec. 16, 1976, abandoned. This application Aug. 16, 1977, Ser. No. 825,127
Int. Cl.[2] F02K *11/04*
U.S. Cl. 244—53 R **4 Claims**



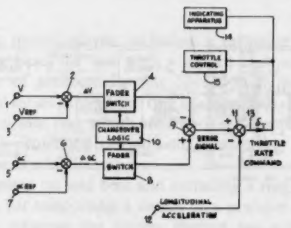
1. A two dimensional nozzle for exhausting products of combustion emanating from a gas turbine engine, a centerbody in said nozzle having side edges in sliding relation with side walls of said nozzle, cooling means for said side walls and said centerbody wherein, said cooling means for said side walls includes flat surfaced side wall panels having inner passages conducting cooling air in indirect heat exchange with said exhausting products of combustion and discharging in the exhaust gas flow path through vertical slots in said side wall panels, said slots being in communication with a cavity in said centerbody such that cooling air leaks therefrom, means to prevent said leaks including spaced dam-like elements disposed in said vertical slots such that when said side edges wipe over said spaced dam-like elements at least one of said elements extends between said cavity and the exhaust stream minimizing said leaks.

4,093,158

AIRPLANE INSTRUMENT WITH THROTTLE CONTROL SELECTIVELY REGULATED BY AIR SPEED OR LIFT

David George Clews, and David Sweeting, both of Maidstone, England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Dec. 23, 1976, Ser. No. 753,711
Claims priority, application United Kingdom, Feb. 11, 1976, 5381/76
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—182 **13 Claims**



1. An aircraft instrument comprising:

(a) means for providing a first signal which is a function of airspeed and suitable for use in controlling an aircraft by variation of the airspeed to a predetermined value;

(b) means for providing a second signal which is a function of lift and suitable for use in controlling the aircraft by variation of the airspeed to adjust the lift to a predetermined value;

(c) selecting means arranged to apply the second signal to signal utilization means for controlling the aircraft in accordance with said second signal except when said second signal falls below a predetermined datum level, which represents a safe margin above stall, whereupon the first signal is applied to the signal utilization means; and

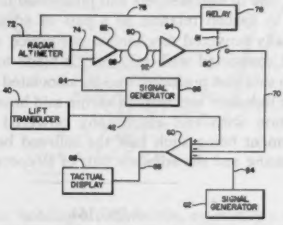
(d) the selecting means being arranged to provide a transition between control by the first signal and control by the second signal which is shorter than a transition between control by the second signal and control by the first signal.

4,093,159

SEMI-AUTOMATIC AIRCRAFT CONTROL SYSTEM

Richard D. Gilson, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Filed Mar. 7, 1977, Ser. No. 775,384
Int. Cl.² G05D *1/12*
U.S. Cl. 244—187 **25 Claims**



1. A flight control system for providing a command perceptible to a pilot representing control correction required to derive an optimum attitude for an aircraft, comprising:

transducer means responsive to the instantaneous aerodynamic status of the airfoil exhibited by said aircraft for deriving an output signal, V_A, corresponding with the instantaneous coefficient of lift exhibited by said airfoil;

first signal generator means for deriving a signal of fixed value, V_D, proportional with a coefficient of lift for said airfoil predetermined to be desired for performance of said aircraft during approach to flare-out and departure maneuvers;

altimeter means having an output signal of value, h, variable in correspondence with the absolute altitude of said aircraft;

second signal generator means for deriving a predetermined signal of fixed value, A, corresponding with a said altitude selected for commencing flare-out performance of said aircraft;

first summing network means coupled to receive said predetermined signal of value, A, and said altimeter output signal of value, h, for deriving an altitude responsive output signal of value corresponding with the expression, A-h, only when said aircraft is at or below said altitude corresponding with said signal of value, A,

second summing network means responsive to said transducer means output signal value, V_A, and said first signal generator means signal of value, V_D, when said aircraft is above a said altitude corresponding with said signal of value, A, and for deriving a control error signal therefrom of value, V_C, in correspondence with the expression:

$$V_C = V_D - V_A,$$

said second summing network means additionally being responsive to said first summing network output signal of value, A-h, when said aircraft is at or below said altitude corresponding with said signal of value, A, for deriving said control error signal in correspondence with the expression:

$$V_C = V_D - V_A + (A-h)\beta,$$

where, β, is an empirically determined calibrating constant; and

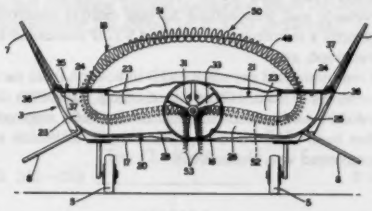
display means responsive to said control error signal to provide a perceptible indication of correction required for establishing an optimum attitude for said aircraft.

4,093,160

FREE VORTEX AIRCRAFT

Ray R. Reighart, II, 4778 Hillcrest North, Hilliard, Ohio 43026

Filed Oct. 15, 1976, Ser. No. 732,996
Int. Cl.² B64C *23/06*
U.S. Cl. 244—199 **19 Claims**



1. Improved free vortex aircraft construction including:

(a) frame means;

(b) shield means mounted on the frame means to generate and shed a substantial amount of vorticity into the air when the aircraft moves forwardly through the air, with said shield means and frame means providing an upper vortex forming zone downwind of the shield means;

(c) vortex duct means located within the frame means, generally beneath the upper vortex forming zone, and extending transversely across the frame means providing a lower vortex zone, with said duct means being provided with a pair of spaced inlet openings communicating with the ends of the upper vortex forming zone;

(d) thruster air duct means located within and extending longitudinally along the frame means and communicating with the vortex duct means intermediate the spaced inlet openings; and

(e) engine means mounted centrally on the frame means and communicating with the thruster duct means to provide thrust for moving the aircraft forwardly through the air and for pumping air from the upper vortex forming zone through the inlet duct openings and vortex duct means to retain and concentrate the vorticity within said upper vortex zone to form a free vortex of low pressure air extending in a generally circular manner across the frame means and through the vortex duct means, with said free vortex acting on the frame means and vortex duct means to produce lift on the aircraft.

4,093,161

CONTROL SYSTEM WITH IMPROVED COMMUNICATION FOR CENTRALIZED CONTROL OF VEHICLES

John H. Auer, Jr., Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

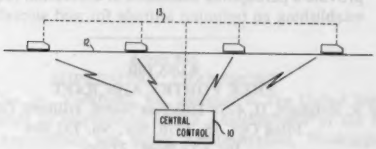
Filed Apr. 25, 1977, Ser. No. 790,737
Int. Cl.² B61L *27/00*
U.S. Cl. 246—5 **8 Claims**

1. A method of operating a plurality of vehicles controlled by a central controlling authority and communicating with the vehicles over a communication facility including the steps of:

(a) manifesting to all vehicles within a common zone of control a permissive GO indication;

(b) communicating information from a plurality of vehicles to a central controlling authority and determining, at said central controlling authority, whether said vehicles or any of them should continue in motion;

(c) for each vehicle it is determined should not continue in motion, formulating and communicating to such specific vehicle a STOP command;



(d) receiving said STOP command aboard said specific vehicle and transmitting to said central controlling authority a manifestation that said STOP command has been received; and,

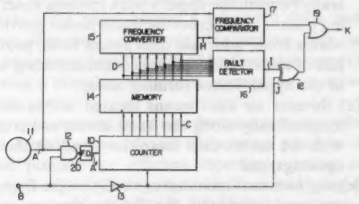
(e) removing said permissive GO indication from each of the vehicles if said central controlling authority does not receive said acknowledgement that said stop command has been received from each vehicle to which a STOP command was transmitted.

4,093,162

TRAIN OPERATION CONTROL APPARATUS

Tadashi Takaoka, Ibaraki, and Eiichi Toyota, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1977, Ser. No. 768,753
Claims priority, application Japan, Feb. 20, 1976, 51-17054
Int. Cl.[2] B61L *3/00*
U.S. Cl. 246—182 B **6 Claims**



1. A train operation control apparatus comprising:

a counter which starts to count an input signal having a frequency proportional to a running speed of the train in response to an operation signal which is produced when the train passes a predetermined point, the content of the counter being indicative of the distance which the train has travelled after passing the predetermined point,

a memory having locations for storing speed instructions predetermined according to the distance which the train has travelled after passing the predetermined point, said instructions being selectively read out according to the content of said counter,

means for setting the content of said counter at a predetermined value before said operation signal is produced,

a fault detection circuit for detecting a failure of said counter according to the content of said memory which is read out in response to said operation signal, and

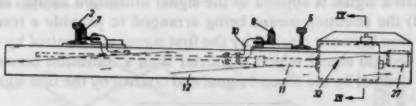
a brake instruction circuit for producing a brake instruction applied to the train upon detection of the failure of said counter, said brake instruction circuit including an exclusive OR circuit which exclusively ORs the output of said fault detection circuit and said operation instruction signal.

4,093,163

SWITCH FOR RAIL POINTS

Bertil Ivar Larsson, Bredaryd, Sweden, assignor to Elektromekano i Bredaryd AB, Bredaryd, Sweden

Filed Jan. 11, 1977, Ser. No. 758,416
Claims priority, application Sweden, Jan. 19, 1976, 7600466
Int. Cl.[2] B61L *9/04, 5/06*
U.S. Cl. 246—476 **7 Claims**



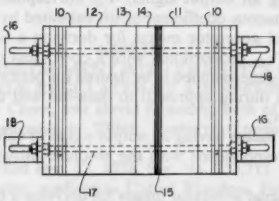
1. An improved switch for rail points arranged to shift a switch blade consisting of two rails interconnected at corresponding free ends to end positions, alternately in engagement with the inner face of one of two railroad track rails, said railroad track rails resting on substantially equidistantly spaced sleepers, the improvement comprising a hollow box girder forming a housing and having substantially the external dimensions of one of said sleepers and positioned in the location of a sleeper in spaced relation to a pair of adjacent sleepers, an electrically powered mechanism positioned within said housing and connected with said switch blade to shift the switch blade to said end positions, and an associated switch blade end position indicator mechanism within said housing and having a connection with said electrically powered mechanism, the arrangement being such that the railroad bed areas between said housing and the adjacent pair of sleepers is unobstructed.

4,093,164

PRECAST ADJUSTABLE FOUNDATION FOR SMALL EQUIPMENT

Edgar L. Borreson, 6133 N. Newburg Ave., Chicago, Ill. 60631

Filed Mar. 25, 1977, Ser. No. 781,500
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—20 **2 Claims**



1. A precast equipment installation foundation for levelling and holding down of equipment having particular base dimensions and absorption of equipment vibration, comprising

two precast concrete end blocks of substantially the same standardized width, each of said end blocks being provided with at least two aligned compression rod holes, and each of said blocks being provided with a continuous channel insert rail on its equipment-mounting face for mounting of equipment,

a plurality of precast concrete blocks of different, standardized widths, positioned between said end blocks, each of said plurality of intermediate blocks being provided with at least two aligned compression rod holes aligned with the holes of said end blocks, and having widths selected to provide a distance between said channel rails approximating the equipment base dimensions,

a plurality of shims having slots aligned with said compression rod holes for fine adjustment of the distance between the channel rails to the equipment mounting dimension,

at least two compression rods and bolts positioned through

said compression rod holes to hold said end blocks, shims and intermediate blocks in compressive relationship, and

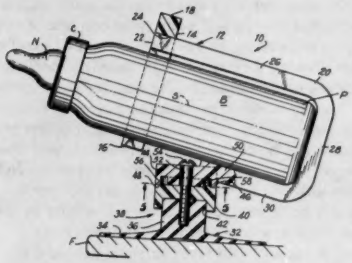
at least four angle-iron legs mounted to said end blocks by means of said compression rods and at each respective end thereof, said angle-iron legs being provided with mounting slots for individual height adjustment of each leg to provide for levelling capability for the compression-loaded foundation assembly.

4,093,165

DEVICE FOR HOLDING BABY BOTTLES

Edward Sussman, 166-25 Powells Cove Blvd., Beechhurst, Queens, N.Y. 11415

Filed Jan. 27, 1977, Ser. No. 762,882
Int. Cl.[2] A47D *15/00*
U.S. Cl. 248—106 1 Claim



1. A device for holding a baby bottle, especially a bottle of the type containing an internal sucking straw, the device comprising a flexible suction cup adapted to grip any flat horizontal surface, a collar encircling the bottle about its circumference, a rod fixed to the collar and encircling the bottle about its lower length, the collar and the rod forming a bottle cage removably retaining the bottle, a swivel mechanism comprising upper and lower bearing members, the rod being fixed to the upper bearing member so as to orient the rod and thereby the cage along an upward slant in the range of 15° to the horizontal, and the suction cup being fixed to the lower bearing member, the flexibility of the suction cup enabling limited manual variation of the upward slant of the cage, and a substantially vertically-oriented pin member passing through and joining the bearing members for rotation about a substantially vertical axis, the lower bearing member carrying a stud and the upper bearing member having an arcuate slot extending through an arc in the range of 180° for receiving the stud, thereby limiting the rotation of one bearing member with respect to the other bearing member.

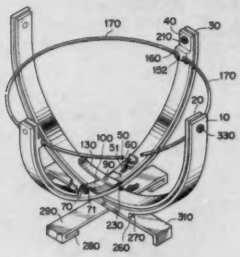
4,093,166

HORIZONTAL POSTURE MAINTENANCE STRUCTURE

Shonosuke Iida, 759 Nishikubo, Chigasaki-shi, Kanagawa-ken, Japan

Filed Jun. 13, 1977, Ser. No. 806,214
Claims priority, application Japan, Aug. 21, 1976, 51-111874[U]
Int. Cl.[2] A47C *7/70*
U.S. Cl. 248—126 7 Claims

1. The horizontal posture maintenance structure comprising: an outer member consists of a slinger and a dangler which curve and are shaped of similar figure and long narrow strip pieces and are pivoted at both ends, and an inner member consists of a rotator and a rocker which curve and are shaped of similar figure long narrow strip pieces by same manner of the foregoing outer member and are pivoted at both ends, and the dangler and the rotator are rotatably engaged at the bottom with each other, and the rocker restores and keeps horizontal



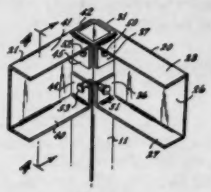
posture and condition against inclination when the both outer and inner member are spread to crossed condition.

4,093,167

CONSTRUCTION OF METAL ARTICLES

Jack Rooklyn, 19339 Citronia, Northridge, Calif. 91324

Filed Aug. 26, 1976, Ser. No. 717,598
Int. Cl.[2] F16B *12/46*
U.S. Cl. 248—188 5 Claims



1. In the construction of metal articles having polygonal upright members and channel shaped transverse members, in combination, an upright member having an end part having flat side portions lying in mutually perpendicular transverse planes, channel shaped transverse members constructed to be secured to the end portion of the said upright member by way of joints, each channel shaped transverse member having side flanges and end parts including portions having surfaces lying in mutually perpendicular transverse planes, configurated to fit against surfaces of the sides of the end part adjacent to but not beyond the end of the upright member, certain of said portions comprising opposed tabs formed by inwardly bent parts of the terminal ends of said side flanges, said tabs nesting on the outside of said upright member and securing means securing the said juxtaposed surfaces to each other, and the bottom of said channel shaped member devoid of its side flanges by the formation of said tabs resting on one of said surfaces of the sides of the end part but not extending beyond the side edge thereof.

4,093,168

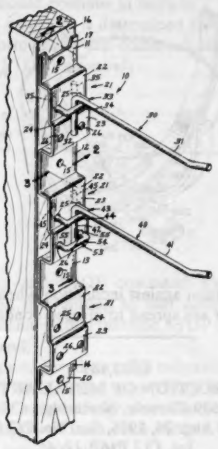
HANGER BRACKET

Robert T. Buril, 1753 James Rd., St. Paul, Minn. 55105

Filed Aug. 19, 1977, Ser. No. 825,919
Int. Cl.[2] A47F *7/28*
U.S. Cl. 248—220.4 7 Claims

1. As a substitute for a perforated mounting board of known thickness and known hole spacing and sizing, a strip of substantially rigid sheet material having at least two mounting flanges to jointly define a reference surface, and having bracket means connected to and located between said flanges with a stepped configuration defining first and second mounting surfaces joined at a step and spaced at lesser and greater distances respectively from said reference surface, the difference be-

tween said distances being substantially said known thickness less the thickness of the sheet material, said first mounting



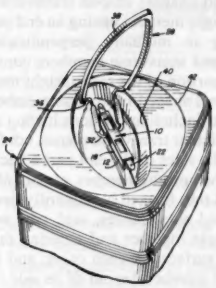
surface being formed with a set of holes, spaced and sized to agree with said known hole spacing and sizing, at locations spaced from said step.

4,093,169

ATTACHABLE HANGER FOR CONTAINERS

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 20, 1976, Ser. No. 752,643
Int. Cl.[2] B65D *23/10*
U.S. Cl. 248—311.3 **8 Claims**



1. A one-piece hanger for a container which comprises:

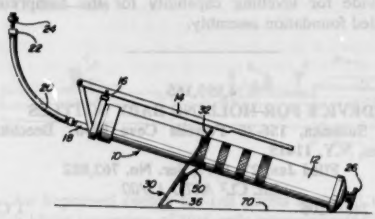
means for attaching said hanger member to a container, an elongated, flexible hanger member, secured at both ends thereof to said attaching means to define a closed loop, and positioned in generally coplanar relationship to said attaching means, said elongated hanger member defining a pair of first flex sections positioned respectively adjacent the ends of said hanger member said first flex sections being adapted to bend to permit said hanger member to be pulled into a more transverse relationship with said attaching means, said elongated hanger member also defining a pair of curved, spaced, second flex sections positioned in spaced relation with the ends of said elongated flexible hanger member, said second flex sections being also adapted to bend, to facilitate the moving of said elongated hanger member into said more transverse relationship.

4,093,170

SUPPORT FOR HAND GREASE GUN

Claude Spray, 6008 Arlington Blvd., Richmond, Calif. 94805

Filed Jan. 31, 1977, Ser. No. 764,460
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—359 **3 Claims**



1. A support for a hand grease gun of the type including an elongated cylindrical body and an oscillatable pump actuating lever swingable toward and away from one side of said body, said support comprising an upstanding inclined panel member having an opening formed through an upper portion thereof and including upstanding opposite side marginal portions and upper and lower marginal portions, said opening being of a size to snugly, but slidingly receive the rear end portion of a cylindrical grease gun body therethrough, an elongated upstanding lever hingedly supported, intermediate its opposite ends, from the downwardly facing side of said panel member for oscillation about a horizontal axis spaced below said opening and extending transversely of said lever outwardly of said side, the upper end portion of said lever extending toward and having its free end projecting slightly into the adjacent lower portion of said opening when said upper end portion is disposed at least generally normal to the center line of said opening, the other lower end of said lever being displaceable toward said panel member in order to effect swinging of said one end portion away from said panel member and retraction of said free end outwardly of said opening, the upper extremity of said opening being spaced but slightly from the upper marginal portion of said panel member, spring means operatively connected between said lever and said panel member yieldingly biasing said lever toward a position with said one end portion thereof disposed generally normal to the center line of said opening and the free terminal end thereof projecting into said opening, the lower marginal edge of said panel member including an integral laterally directed integral horizontal support flange for support from a horizontal support surface, said support flange projecting outwardly of said downwardly facing side of said panel member and the included angle defined between said panel member and support flange being less than 90°.

4,093,171

FISHING-ROD HOLDER

Alfred Mengo, Sr., 4302-83rd St., Kenosha, Wis. 53140

Filed Oct. 21, 1976, Ser. No. 734,619
Int. Cl.[2] A01K *97/10*
U.S. Cl. 248—515 **1 Claim**

1. A holder for supporting a fishing rod, comprising a base, a bracket having a panel pivotally secured to said base, and upwardly-extending spaced walls integral with said panel, a tubular member intermediate said walls, pivot means to support said tubular member relative to said walls, said tubular member conforming at the lower end thereof to a plane angularly directed relative to the axis of said tubular member, and a

stop member slidably-secured to said panel, said stop member being slidably guided intermediate said walls and having an

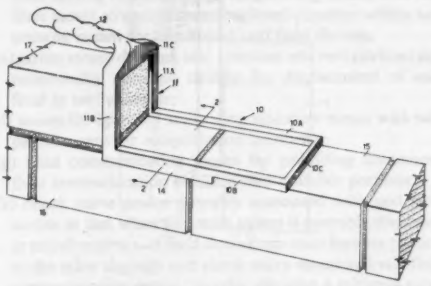
upwardly-directed tongue to engage said plane of said tubular member.

4,093,172

TOOL FOR BRICKLAYING

Kenneth Frank Johnson, 22 Station Road, Deagon. Q. 4017, Australia

Filed Apr. 12, 1977, Ser. No. 786,890
Int. Cl.[2] E04G *9/00*
U.S. Cl. 249—19 9 Claims



1. A hand tool to aid in laying an upper course of bricks on a lower course of similar bricks, said hand tool comprising a frame and a handle connected to the frame, said frame including: a pair of similar L-shaped side members each having a long leg and a short leg and spaced laterally apart in lateral alignment with one another by a frame end member;

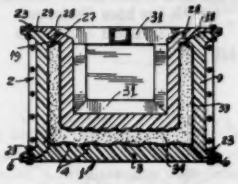
said long and short legs being provided with outer side flanges projecting laterally of said long and short legs respectively such that said long legs are adapted to be placed on a lower course of bricks with their respective side flanges overlaying side faces of that lower course whereby to define a gauge cavity to receive mortar on which a brick of an upper course is to be bedded and said short legs are adapted to engage an end face of an already laid immediately preceding brick of the upper course to define a gauge cavity to receive mortar which is to be sandwiched between the two said bricks of the upper course.

4,093,173

MOLD FOR MANUFACTURE OF BODIES FOR TRANSPORTING UNITS

Tadahisa Kawamata, Rua Pirassununga, 484; Carlos Jorge Freire Antunes, Rua Bento de Matos, 133/33, and Carlos de Brito Antunes, Rua Augusta, 2110/11, all of Sao Paulo, Brazil

Division of Ser. No. 642,237, Dec. 18, 1975, abandoned. This application May 23, 1977, Ser. No. 799,145
Claims priority, application Brazil, Dec. 23, 1974, 010738
Int. Cl.[2] B29C *5/00, 1/14;* B29F *1/00*
U.S. Cl. 249—105 10 Claims



1. Apparatus for the manufacture of a body having a bottom, at least four side walls, at least one door, and a roof for isothermal transport units, such as refrigerated or heated trucks, trailers, railway cars and the like, comprising

a single pair of molds consisting of an internal mold and an external mold for molding a main structure comprising the bottom, the side walls, and at least one door opening of the body in a single monocoque part, the main structure external mold comprising:

a bottom panel;

side wall panels;

plates for the bottom and the side wall panels having an internal face with relief corresponding to the desired external configuration of the body, and external faces having reinforcing ribs;

means for securing the bottom panel plates to each of the side wall panel plates;

a double rim on the upper edge of the side panel plates comprising (i) an inner rim having an upper section inclined to the plate and a lower stepped section and (ii) an external flat horizontal rim;

orifices through the lower stepped section of the inner rim of the double rim of the side panel plates for injection of molding material;

spaced apart bolt holes through the extended horizontal rim of the double rim of the side panel plates for securing the external mold to the internal mold; and

at least one rectangular door opening through the side panel plates having a size, configuration and location desired for a door of the body;

the main structure internal mold comprising

a substantially prismatic box having an open top for the internal mold, wherein the box comprises:

an outer surface with relief corresponding to the desired internal configuration of the body;

sides having rectangular openings extending to and through the bottom of the box, the openings corresponding to openings in the side panels of the external mold;

an inclined flat circumferential ribbon around the top of the box;

spaced apart orifices through the circumferential ribbon for injection of molding materials located so the injection orifices of the main body external mold and the main body internal mold are aligned when the main body external and internal molds are assembled;

a horizontal peripheral rim extending from the circumferential ribbon for suspending the internal mold on the extended horizontal rim of the double rim of the external mold; and

spaced apart holes through the horizontal peripheral rim for

securing the internal mold to the external rim of the side panel of the external mold so that the walls and bottom of the prismatic box are suspended away from the bottom and side panels of the main body external mold when the main body external and internal molds are assembled.

4,093,174

COMBINATION DIE AND PALLET

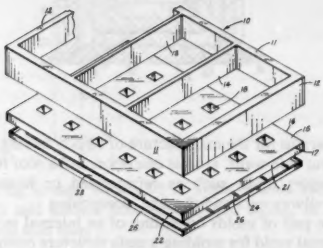
Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 681,419, Apr. 29, 1976, Pat. No. 3,998,423. This application Oct. 6, 1976, Ser. No. 730,138

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.[2] B28B *7/24, 7/26*

U.S. Cl. 249—120 **10 Claims**



1. In a combination die and pallet of honeycomb construction;

(a) a die plate of rectangular shape presenting end and side edges and formed with a plurality of depressions arranged in longitudinal rows,

(b) each of said depressions being defined by a frusto pyramidal wall and a flat bottom,

(c) end flanges depending from said end edges and side flanges depending from said side edges, said flanges being integral with said die plate, having lower edges, and of a height slightly less than the depth of said depressions,

(d) a rectangular base plate of the same size and shape as said die plate and presenting end and side flanges,

(e) fused joints between those portions of the side and end flanges on the die plate which overlap portions of the side and end flanges of the base plate,

(f) spot fusions between said base plate and the bottoms of said depressions, and

(g) a plurality of longitudinal ribs upstanding from said base plate and pressed therefrom leaving grooves opening onto the lower face of said base plate, said ribs being parallel to the side edges of said plates and alternately disposed between said side edges and said longitudinal rows of depressions.

4,093,175

DISTENSIBLE ELASTOMERIC MOLDS

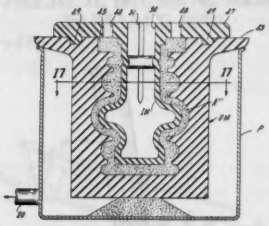
Raymond M. Putzer, Racine, and William J. Maurino, Kenosha, both of Wis., assignors to Precision Flexmold, Inc., Racine, Wis.

Continuation of Ser. No. 403,197, Oct. 3, 1973, abandoned, which is a division of Ser. No. 222,141, Jan. 31, 1972, Pat. No. 3,776,683. This application Jul. 8, 1974, Ser. No. 486,330

Int. Cl.[2] B28B *7/16, 7/28, 7/30*

U.S. Cl. 249—153 **7 Claims**

1. A male and female distensible elastomeric mold including an outer female portion having an integral radially extending annular flange adjacent its upper portion for being supported on a supporting edge, said female portion having an internal cavity containing considerable undercut back draft portions, said mold also including an inner male portion in said cavity and forming an annular space with said female portion that defines the shape of an article to be produced in said mold, said outer mold portion being expandable when vacuum is applied thereto so as to withdraw from an article produced in said



mold and said inner mold portion collapses inwardly when vacuum is applied thereto so as to be withdrawn from the interior of said article produced in said mold.

4,093,176

MOLD-LOCKING DEVICE

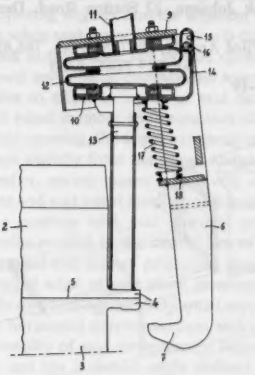
Andre Contastin, Severac-le-Chateau, France, assignor to Industries et Techniques d'Ameublement, Severac-le-Chateau, France

Filed Mar. 2, 1977, Ser. No. 773,780

Claims priority, application France, Mar. 3, 1976, 76 06603

Int. Cl.[2] B29C *1 /16;* **B22C** *21/08;* **B65D** *45/00*

U.S. Cl. 249—167 **4 Claims**



1. The combination of a two part mold having engaging rims and a locking device for said mold, said locking device comprising:

a support means fixed at one end to one of said rims;

a flexible bellows mounted at the other end on said support means;

a movable plate member secured to the opposite end of the bellows;

air inlet means passing through said movable plate member to the interior of the bellows;

a hook-like member rigidly secured to the movable plate member; and

compression spring means extending between the hook-like member and the fixed support means; and

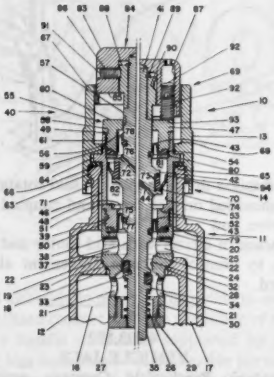
means on said hook-like member and said support means for limiting movement by the spring means of the movable plate member towards the fixed support member in the absence of pressure in the bellows to pivot said hook-like member relative to said mold to engage the other of said rims.

4,093,177

DASHPOT MECHANISM FOR SELF-CLOSING PLUMBING VALVES

Earl L. Morris, Whittier, and Larry D. Fields, La Puente, both of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Mar. 18, 1976, Ser. No. 668,285
Int. Cl.[2] F16K *31/48;* F16F *9/10*
U.S. Cl. 251—54 3 Claims



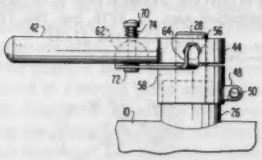
1. A fluid-filled dashpot mechanism comprising:
(a) housing means having a passageway therein;
(b) stem means reciprocally disposed in said passageway;
(c) pushbutton means secured to one end of said stem means for operably displacing said stem means;
(d) a pair of rolling diaphragms disposed in face-to-face relationship in said passageway and operably coupled in fluid sealing relationship to said housing means and said stem means so as to form an enclosed chamber within said housing means for containing said fluid therein;
(e) piston means dividing said chamber into two portions and reciprocally operable therein for displacement of said fluid in said chamber;
(f) means for operably associating said stem means with said piston means for reciprocation therewith;
(g) fluid communication means for providing continuous fluid communication between said chamber portions;
(h) check valve means operably associated with said stem means so that when said stem means is operably displaced in one direction said fluid flows from one chamber portion to the other through said check valve means and said fluid communication means, thereby allowing a reltively rapid displacement of said fluid between said chamber portions and effectuating relatively rapid displacement of said piston means and said stem means, and when said stem means is operably displaced in the opposite direction said fluid flows from said other portion to said one chamber portion through said fluid communication means thereby allowing a relatively slow displacement of said fluid between said chamber portions and effectuating relatively slow displacement of said piston means and said stem means; and
(i) stop means for limiting the stroke of said stem means, wherein said stop means for operably limiting the stroke of said stem means includes threaded rod means one end of which is threadably disposed in said pushbutton means and the other end extending beyond said pushbutton means towards said housing means, the distance between said other end of said rod and said housing means determining the stroke of said piston means by limiting the axial displacement of said stem means.

4,093,178

VALVE

Robert T. Hughes, Columbia, and R. Hurley Matthews, Bel Aire, both of Md., assignors to Humat, Inc., Washington, D.C.

Filed Mar. 16, 1976, Ser. No. 667,312
Int. Cl.[2] F16K *35/02*
U.S. Cl. 251—104 3 Claims



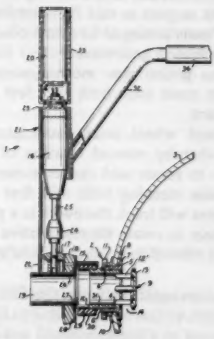
1. A valve for use in a conduit having a smooth cylindrical internal surface comprising shaft means extending diametrically of said conduit, a circular valve disc, means for securing said valve disc to said shaft, said circular disc having oppositely bevelled surfaces on opposite sides of said shaft, an annular groove extending about the entire periphery of said disc, sealing means secured in said groove for sealing engagement with the internal surface of said conduit, adjustable locking means for locking said valve disc at a selected angle relative to a transverse plane through said conduit comprising handle means secured to said shaft means, a locking member movably mounted on said handle means, locking plate means having a plurality of locking apertures for said locking member and means for adjustably securing said locking plate to said conduit for infinite adjustment of said locking plate relative to said conduit.

4,093,179

POWER WRENCH

Charles F. Schmidt, P.O. Box 126, Junction City, Kans. 66441

Filed Dec. 30, 1976, Ser. No. 755,677
Int. Cl.[2] F16K *31/04;* F16L *55/10*
U.S. Cl. 251—133 7 Claims



1. A power wrench for operating gate valves on irrigation water pipe, said gate valve including a tubular discharge portion on the valve and extending outwardly of said pipe, said wrench comprising:
(a) a gripping member having a bore with an interior surface for separably and frictionally engaging a tubular discharge member, said bore forming a flow passage therethrough aligned with the tubular discharge member;
(b) power means for imparting reversible rotary motion; and
(c) speed reduction means operatively connecting said power means with said gripping member for selectively rotating same for opening and closing the gate valve and

permitting unobstructed water flow therethrough during opening and closing movement thereof.

4,093,180

GEARED HAND WHEEL FOR BUTTERFLY VALVES

Joseph Lawrence Strabala, Orinda, Calif., assignor to James M. Carroll Company, Orinda, Calif.

Continuation of Ser. No. 513,093, Oct. 8, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 717,055
Int. Cl. F16k *31/53*
U.S. Cl. 251—248 8 Claims

1. For a butterfly valve having a projecting valve shaft for turning its control disc to open and closed positions, a disc-shaped geared handle comprising:

a first circular gear means having attaching means for connecting it to a valve shaft of a butterfly valve;

a second circular gear means having anchor means for securing it to a butterfly valve in a non-rotating relationship therewith, said first and second circular gear means arranged concentrically and in adjacent relationship with said second circular means having at least one tooth difference with respect to said first circular gear means;

a carrier means arranged to rotate concentrically with said first and second gear means;

at least one pinion gear means journalled in said carrier means to mesh with both said first and second circular gear means;

circular hand wheel means associated with said carrier means whereby manual rotation of said hand wheel is operable to rotate said carrier means so that said pinion gear means meshing with said first and second circular gear means will track therewith in a planetary manner and cause them to rotate slowly relative to one another, in a direction related to the direction of rotation of the carrier and

stop means arranged between the first and second circular gear means so that it is operable to limit the relative rotation thereof to a predetermined amount.

4,093,181

POWERED VEHICLE JACK

Raymond W. Ivins, 1901 SE. Minter Bridge Rd., #69, Hillsboro, Oreg. 97123

Filed May 9, 1977, Ser. No. 795,393
Int. Cl.² B66F *3/02*
U.S. Cl. 254—97 5 Claims

1. An automotive jack comprising in combination,

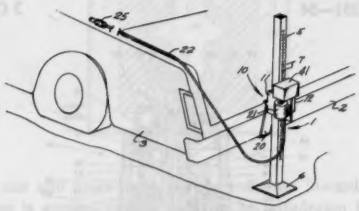
a jack standard supported in a stationary manner by a ground engaging base and having recesses spaced therealong, and

a carriage for powered travel along said standard and including,

a roller equipped frame for rolling travel along said standard,

a bumper engaging arm mounted on said frame,

rotatable means on said frame engageable with said standard recesses,



a gear reduction drive coupled to said rotatable means,

a motor mounted on said frame and coupled to said reduction drive, and

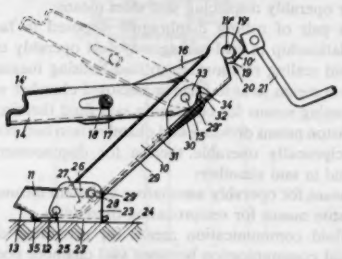
switch means in circuit with said motor and with a power source to control carriage movement along said jack standard.

4,093,182

VEHICLE JACK

Hugo Rutenbeck, Breckerfeld, Germany, assignor to Firma August Bilstein, Ennepetal, Germany

Filed May 23, 1977, Ser. No. 799,763
Claims priority, application Germany, Jun. 4, 1976, 2625085
Int. Cl.² B66F *3/12*
U.S. Cl. 254—126 15 Claims



1. In a vehicle jack having a support leg with a bearer foot, a manually operable adjusting member, in particular a screw spindle, coupled to the support leg, a lifting arm capable of being raised and lowered by the adjusting member and having at its free end a support head engaging the vehicle frame, and an auxiliary foot movably carried upon the support leg, the improvement which comprises a coupling member arranged to act upon the auxiliary foot and operatively displace upon operation of said adjusting member, which coupling member, upon the raising of the lifting arm brings into effect an additional support provided by the auxiliary foot and prevents inadvertent release of the jack.

4,093,183

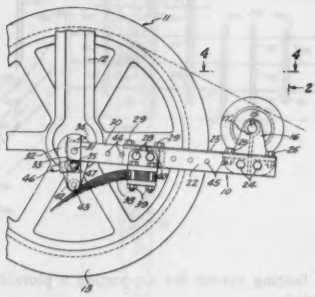
UNITARY GROUNDING ASSEMBLY FOR BUNDLE CONDUCTOR STRINGING BLOCKS

Keith E. Lindsey, Pasadena, and Hoyt W. Bozeman, Jr., Glendora, both of Calif., assignors to Lindsey Manufacturing Company, Azusa, Calif.

Filed Jun. 23, 1977, Ser. No. 809,409
Int. Cl.² B66D *1/36*
U.S. Cl. 254—134.3 PA 6 Claims

1. A grounding assembly adapted to be pivotally mounted

astride the frame of a bundle conductor stringing block comprising: a U-shaped main body having a pair of generally parallel legs interconnected crosswise of one end thereof by a shaft supporting a separate conductive roller for each conductor of a bundle conductor, the other ends of said legs including means for pivotally mounting said assembly on the opposite lateral sides of the frame of a bundle conductor stringing block, means



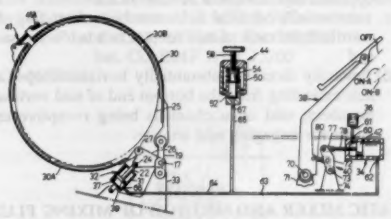
for biasing said assembly to pivot in a direction to maintain said rollers in pressurized contact with the underside of a respective conductor of a bundle conductor supported by a stringing block, and said legs including resilient flexible portions permitting the roller-supporting ends of said legs to twist generally about the length thereof and said roller-supporting shaft to tilt away from the normally prevailing plane thereof to accommodate differential conductor sag conditions.

4,093,184

HYDRAULIC BRAKE SYSTEM FOR CRANE HOIST DRUM

John E. Wieschel, Hartland, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Mar. 7, 1977, Ser. No. 774,962
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—139.1 **3 Claims**



1. In a hydraulic brake system for the hoist drum of a lifting crane having an operator's station having a floor, in combination:

a hoist drum shaft to be braked;

a brake band for exerting a braking force on said hoist drum shaft;

a brake cylinder operatively connected to said brake band, said brake cylinder comprising a cylinder and piston defining a chamber for accommodating brake fluid therein;

a brake valve located near said floor of said operator's station for controlling the supply of fluid to said brake cylinder, said brake valve comprising a cylinder and a piston defining a chamber for accommodating brake fluid therein;

a source of fluid;

means for supplying fluid from said source to said chamber in said brake valve;

a supply line for supplying fluid from said brake valve chamber to said brake cylinder chamber;

a branch line having one end connected to said supply line and having its other end near said operator's station;

a brake pedal mounted near said floor of said operator's station and movable between a brake release position and a brake applied position;

a valve toggle linkage connected between said foot pedal and said piston of said brake valve, said valve toggle linkage causing said brake valve to supply fluid at a predetermined pressure when said pedal is moved to a first brake applied position and a greater pressure when said pedal is moved to a second brake applied position;

and a hydraulic simulator located near said operator's station for adjusting the position to which said foot pedal can be moved when depressed, said hydraulic simulator comprising a cylinder, a piston slideable in said cylinder and cooperating therewith to define a fluid receiving chamber, said fluid receiving chamber being connected to said other end of said branch line, biasing means for biasing said piston to a position wherein all fluid is expelled from said fluid receiving chamber, a manually adjustable stop means for limiting the travel of said piston, said stop means being manually adjustable to limit the amount of fluid that can be supplied from said brake valve to said hydraulic simulator when said pedal is depressed to thereby control the extent to which said pedal can be depressed said hydraulic simulator further comprising a hollow housing having a pair of end walls spaced apart axially along an axis through said housing, each of said end walls having an opening therethrough along said axis, wherein said cylinder is mounted in the opening in one of said end walls and along said axis, said cylinder having openings at its opposite ends, one of said openings being threaded for receiving said other end of said branch line, wherein said piston is slideable in said cylinder along said axis and has a portion extending into said housing,

wherein said manually adjustable stop means has a threaded portion which threadedly engages threads in said opening in the other of said end walls, said stop means extending into said housing and being engagable with said piston,

wherein said biasing means is disposed between said other end wall and said piston,

and wherein said fluid receiving chamber communicated directly with said threaded opening in said cylinder.

4,093,185

DRIVE MECHANISM FOR A LINE-PULLING APPARATUS

E. Strohm Newell, 2350 6th Ave., San Diego, Calif. 92101

Filed Jun. 28, 1976, Ser. No. 700,154
Int. Cl.[2] B66D *1/30*
U.S. Cl. 254—154 **36 Claims**

1. An apparatus for pulling a line comprising:

(a) a capstan mounted to rotate about stationary centerpost means,

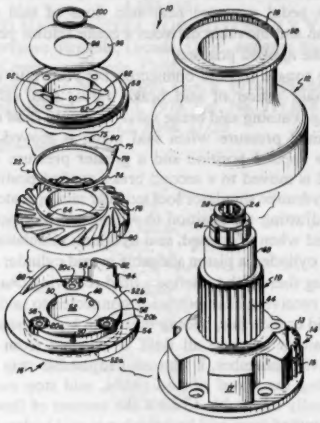
(b) pulley means mounted to rotate about said centerpost means,

(c) means for rotating said capstan and pulley means in unison about said centerpost means, and

(d) stationary bearing surface means including a stationary coupling bearing portion fixedly mounted with respect to said centerpost means,

(e) said means for rotating including coupling means con-

tained within the confines of said stationary coupling bearing portion and mounted to dynamically engage said



capstan and pulley means while moving juxtaposed said coupling bearing portion.

4,093,186

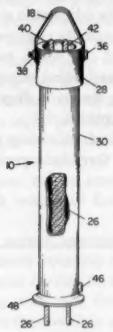
LINE BRAKE DEVICE USEFUL FOR FIRE ESCAPE

Steven T. Golden, 822 Teague, Santa Paula, Calif. 93060

Filed Nov. 22, 1976, Ser. No. 743,754

Int. Cl.[2] B65H *59/16*

U.S. Cl. 254—156 **6 Claims**



1. A manually operated line braking mechanism comprising:

two pulley assemblies;

means for holding said pulley assemblies apart from each other, including a cylindrical frame holding one of said pulley assemblies and a cylindrical head piece holding the other of said pulley assemblies;

a line;

means for guiding said line through said pulley assemblies so that different sections of said line extend between said pulley assemblies with said line sections close to each other as said line runs through said pulley assemblies; and

means for rotating one of said two pulley assemblies with respect to the other including a rotatable connection between said frame and head piece whereby the sections of line between said assemblies frictionally engage one another to provide braking action without significantly increasing the temperature of said braking mechanism.

4,093,187

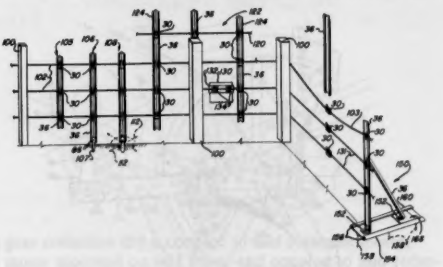
FENCING STAY SYSTEM

Charles Elbert Robinson, Livermore, Colo. 80536

Filed Dec. 22, 1975, Ser. No. 643,074

Int. Cl.[2] E04H *17/10*

U.S. Cl. 256—49 **1 Claim**



1. A fencing system for supporting a plurality of barriers comprising:

a plurality of anchors for connecting to said barriers, each of said anchors comprising:

a. a mid-section portion of rectangular configuration,

b. substantially vertical side members on opposing longitudinal sides of said mid-section portion extending downwardly from said sides,

c. means disposed on the upper surface of said mid-section portion for connecting said anchor to one of said barriers, and

d. substantially horizontal opposing edges in parallel spaced relation extending outwardly from the bottom of each of said side members; and

a plurality of stays for providing support to said barriers, each of said stays comprising:

a. a longitudinal member having a mid-section portion of angular cross-section, said aforesaid member having downwardly extending sides convergent into a center rib,

b. each of said convergent sides terminating at the end opposite said rib into a reverse bend,

c. substantially vertical side members extending downwardly from each of said reverse bends toward said rib, and

d. inwardly directed substantially horizontal open channels extending from the bottom end of said vertical side members, said open channels being receptive of said edges for engaging said anchor.

4,093,188

STATIC MIXER AND METHOD OF MIXING FLUIDS

Terry A. Horner, c/o TAH Industries, P.O. Box 178, Imlaystown, N.J. 08526

Filed Jan. 21, 1977, Ser. No. 760,876

Int. Cl.[2] B01F *15/00*

U.S. Cl. 366—336 **20 Claims**

1. An element for a static mixer for mixing fluids comprising:

at least two banks of stationary baffle plates arranged around an axis which is parallel to the overall direction of flow of the fluids to be mixed,

each bank abutting each adjacent bank along an interface extending from said axis so as to form interfacial apertures through which fluids may flow from one bank to an adjacent bank,

the plane of each baffle plate being inclined at an angle to said axis and being inclined at an angle to the planes of the baffle plates of each adjacent bank,

each bank having a first set comprising a plurality of baffle plates spaced along said axis with their planes substantially parallel to each other,

at least one of said banks having a second set comprising a plurality of baffle plates with their planes substantially parallel to each other spaced along said axis and being similarly inclined to said axis as the baffle plates of said first set but at an angle different from the angle at which the baffle plates of said first set are inclined to the axis,

the baffle plates of said second set in said at least one bank being interspersed with the baffle plates of the first set in that bank, and

the plane of each plate in said second set intersecting the plane of at least one plate in said first set in the same bank at an intersection near the outer edges of said plates.

4,093,189

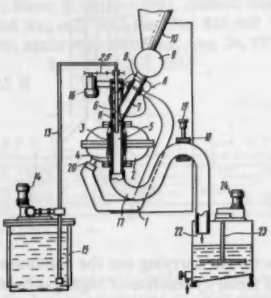
APPARATUS FOR CONTINUOUS PREPARATION OF A SUSPENSION

Iosif Borisovich Sokol, bulvar matrosa Zheleznyaka, 11[e], kv. 79; Nina Vladimirovna Katysheva, Angarskaya ulitsa, 49, korpus 2, kv. 167; Vladimir Mikhailovich Belyaev, Angarskaya ulitsa, 59, kv. 23, all of Moscow; Dmitry Danilovich Logvinenko, ulitsa Kalinina, 5, kv. 5; Ekaterina Alexandrovna Morozko, ulitsa K.Libknekhta, 22, both of Poltava; Boris Alexeevich Pepelin, Bulatnikovsky proezd, 10, kv. 746, and Viktor Alexeevich Prudovoi, Snaiperskaya ulitsa, 6, korpus 3, kv. 40, both of Moscow, all of U.S.S.R.

Filed Oct. 18, 1976, Ser. No. 733,383

Int. Cl.[2] B01F *7/00, 15/00*

U.S. Cl. 366/156 **3 Claims**



1. An apparatus for continuous preparation of a suspension, comprising: a framework; a housing mounted on said framework; an inductor for producing a rotating electromagnetic field having a generally annular shape and being accommodated within said housing; a mixing chamber having a body receiving therein ferromagnetic particles and encircled by said inductor; a flexible conduit; a rotatable hollow shaft, one end of which communicates via said flexible conduit with a supply of a liquid component of the suspension to be prepared and the other end of which communicates with said body of said mixing chamber; a feed line; a tube having a branch pipe, one end of said branch pipe communicating via said feed line with a supply of a solid component of the suspension to be prepared, the other end of said branch pipe communicating via said tube with said body of said mixing chamber, said hollow shaft being accommodated inside said tube; a feed screw mounted on said hollow shaft and being inside said tube; means for effecting rotation of the feed screw mounted on said housing; a discharge device including an S-shaped conduit having one end connected to a bottom of said body of the mixing chamber.

4,093,190

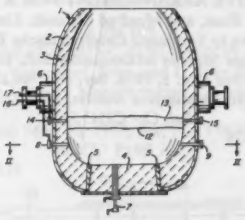
PROCESS FOR THE PROTECTION OF A REFRACTORY WALL IN SERVICE

Emile Sprunck, Moyeuvre, and Pierre Jean Leroy, St. Germain en Laye, both of France, assignors to Creusot-Loire, Paris, France

Continuation-in-part of Ser. No. 590,054, Jun. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 234,727, Mar. 15, 1972, abandoned. This application Jan. 24, 1977, Ser. No. 761,967

Int. Cl.[2] C21B *7/16*

U.S. Cl. 266—47 **2 Claims**



1. In a process for treating a bath of molten metal in a refractory-lined metallurgical furnace by introducing oxygen into said bath, the improvement comprising:

controllably injecting liquid hydrocarbons through at least one single tube tuyere in said refractory lining located beneath the dynamic level of said bath, said tuyere being sufficiently spaced away from the source of said oxygen introduction to prevent free gaseous oxygen from contacting said hydrocarbons and said liquid hydrocarbons being injected in sufficient quantity so as to direct said hydrocarbons toward selected portions of said refractory lining and thereby to retard the wear of said selected portions.

4,093,191

SAFETY DEVICE FOR WELDING TORCH

Charles L. Ferguson, 4303 Fluhr Dr., Louisville, Ky. 40216

Filed Nov. 19, 1976, Ser. No. 743,094

Int. Cl.[2] B23K *7/00*

U.S. Cl. 266—48 **4 Claims**

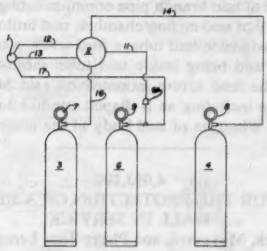
1. A fire extinguishing/fuel-oxidizer burning torch arrangement including: torch means for combining fuel and oxidizer; fuel supply means to supply selected fluid fuel to said torch means; oxidizer supply means to supply selected fluid oxidizer to said torch means; fire extinguishing material supply means to supply selected fluid fire extinguishing material; valve means including:

(a) first passageway means communicating with said fuel supply means and said torch means with valve member operable from first position;

(b) second passageway means communicating with said oxidizer supply means and said torch means;

(c) valve member means operable from first position to initiate flow of fuel through said first passageway means

and flow of said oxidizer through said second passageway means to second position to terminate flow of fuel through said first passageway means and terminate flow of said oxidizer through said second passageway means;



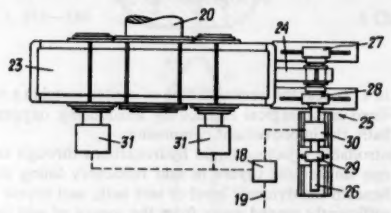
(d) valve member control means responsive to pressure of said fire extinguishing material supply means to operate said valve member means from said first position to said second position upon selected decrease in pressure of said fire extinguishing material.

4,093,192

TILTING DRIVE ARRANGEMENT FOR A CONVERTER

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 1, 1976, Ser. No. 746,236
Claims priority, application Austria, Dec. 12, 1975, 9449/75
Int. Cl.[2] C21C *5/46*
U.S. Cl. 266—78 **6 Claims**



1. In a tilting drive arrangement for a converter having a gear within a gear housing arranged on a tilting trunnion of the converter and a torque support for supporting the gear housing on a base, the torque support including a guide rod hinged to the gear housing, a torque rod supported on the base in bearings, and a lever arranged to connect the guide rod to the torque rod so as to produce a torsional moment in the torque rod, the improvement comprising a torsion measuring means located on the torque rod for measuring the torque in the torque rod and hence the tilting moments.

4,093,193

COMPOSITE HIGH TEMPERATURE PROTECTION TUBE

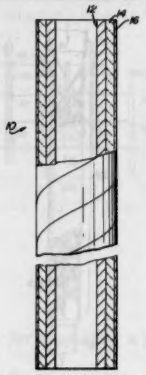
John E. Cassidy, Churchville, and Max H. Kraus, Huntingdon Valley, both of Pa., assignors to Electro-Nite Co., Philadelphia, Pa.

Filed Jun. 7, 1977, Ser. No. 804,417
Int. Cl.[2] C21C *7/00*; F16L *9/14*; B65N *81/00*
U.S. Cl. 266—87 **13 Claims**

1. A composite high temperature protection tube, comprising:

(a) an inner core of a first material,

(b) an intermediate zone surrounding said core and being of a different material, said intermediate zone being supported by said core, said intermediate zone being spirally wound layers of ceramic paper bonded together, said ceramic paper being inorganic and having an organic binder in amounts sufficient to increase the tear strength thereof so that said ceramic paper may be unwound from



a roll by pulling on an unwound portion thereof, said ceramic paper having a thermal conductivity less than 2 BTU-in./hr.Ft.[2]° F. at a mean temperature of 2000° F,

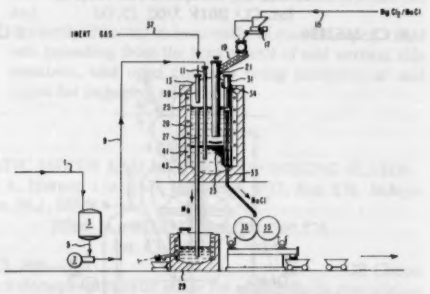
(c) an outer wrap bonded to itself along overlapping side edges and spirally wound around and confining said intermediate zone.

4,093,194

PROCESS AND REACTOR FOR MAKING MAGNESIUM METAL

Norval D. Clare, Niagara Falls, N.Y., and Charles H. Lemke, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 648,761, Jan. 13, 1976, Pat. No. 4,014,687.
This application Dec. 28, 1976, Ser. No. 755,124
Int. Cl.[2] C22B *3/02*
U.S. Cl. 266—122 **4 Claims**



1. A reactor for carrying out the continuous production of magnesium metal by reaction of $MgCl_2$ and sodium in an anhydrous liquid phase comprising

(a) an enclosed upright shell;

(b) an upper outlet pipe for withdrawing molten materials through the bottom of the reactor by overflow as the level of such materials exceeds a preselected upper liquid operating level within the reactor;

(c) an inert gas inlet pipe for blanketing the zone above the preselected upper liquid operating level with inert gas;

(d) inlet means for injecting granular solids containing

$MgCl_2$ below a preselected lower liquid operating level within the reactor;

(e) an inlet pipe for injecting molten sodium metal below the granular solids inlet; and

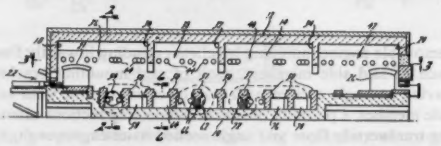
(f) a lower outlet pipe for receiving molten material and withdrawing it from the reactor by overflow as the level of such materials exceeds a preselected lower liquid operating level, the L/D ratio of the reactor below the preselected lower liquid operating level being at least about 1:1.

4,093,195

CARBURIZING FURNACE

Donald J. Schwalm, Northville, Mich., assignor to Holcroft & Company, Livonia, Mich.

Filed Jan. 19, 1977, Ser. No. 760,567
Int. Cl.² C21D *1/00*
U.S. Cl. 266—251 **16 Claims**



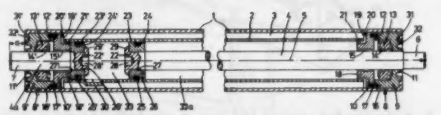
1. Carburizing apparatus comprising a furnace having means defining heating, carburizing and diffusion zones, longitudinally spaced piers mounted on the floor of said furnace in each of said zones and extending transversely between the side walls of said furnace, track means on said piers and means for conveying a plurality of work trays along said track means successively through said zones, means for introducing into each of said zones a gas atmosphere appropriate to that zone, and fan means in each zone for circulating the atmosphere therein through the work in said zone, said fan means each comprising a fan mounted in a side wall of said furnace and having its inlet and its outlet in said side wall below the level of said track means with said inlet and outlet being longitudinally spaced apart and separated by at least one of the piers in said zone, whereby atmosphere is circulated downwardly through the work at one pier position and upwardly through the work at an adjacent pier position within said zone.

4,093,196

LENGTH-ADJUSTABLE GAS SPRING

Fritz Bauer, Altdorf, Germany, assignor to Suspa Federungstechnik Fritz Bauer & Sohne OHG, Altdorf, Germany

Filed Aug. 17, 1977, Ser. No. 825,463
Claims priority, application Germany, Aug. 26, 1976, 2638363
Int. Cl.² F16F *9/32*
U.S. Cl. 267—65 R **6 Claims**



1. A continuously length-adjustable compressed gas-filled spring, such as for height adjustment of chair seats, table tops or the like comprising

an outer cylinder constituting a housing; an inner cylinder coaxially disposed in said outer cylinder, and defining an annular chamber therebetween; a piston mounted coaxially displaceably within said inner cylinder, said piston sealingly contacting the inner wall of said inner cylinder to prevent leakage of said gas across said piston between a first chamber on one side of said piston and a second chamber on the other side of said piston, said piston being connected to a piston rod extending through one end of the housing in a gas-tight manner through a first sealing plug at one end of said cylinders, a second sealing plug to seal the two cylinders at the opposite end in a gas-tight manner; means to provide communication between said first and second chambers separated in a gas-tight manner by the piston on the piston rod, said means comprising a valve including a valve push rod serving as a valve release pin and extending through the other end of said housing in a gas-tight manner through said second sealing plug, a first bypass channel located in the vicinity of said second sealing plug which is in the vicinity of said valve push rod, a second bypass channel located in the vicinity of said first sealing plug,

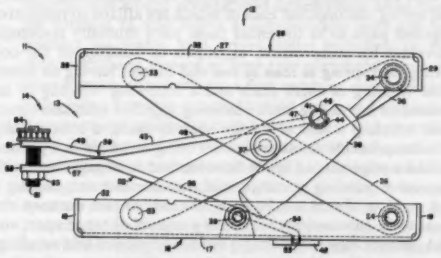
said valve comprising a piston sealing element coaxially displaceably mounted and guided in a gas-tight manner in said inner cylinder on said valve push rod; a bypass depression in the inner wall of said inner cylinder, whereby said valve is opened by moving said piston sealing element axially adjacent said bypass depression to provide gas flow communication between said first and second chambers through said bypass depression, said first and second bypass channels and said annular chamber, and said valve is closed when said piston sealing element is in a position axially spaced from said bypass depression to close said gas flow communication between said first and second chambers.

4,093,197

LEAF SPRING SUSPENSION

John W. Carter, Bettendorf, Iowa, and L. John Koutsky, Milan, Ill., assignors to Sears Manufacturing Company, Davenport, Iowa

Filed Mar. 16, 1977, Ser. No. 778,019
Int. Cl.² F16F *1/22*
U.S. Cl. 267—131 **10 Claims**



1. A suspension for use with a support structure for a seat, the support structure having upper and lower halves interconnected and variably spaced apart by movable linkage members, the seat being attached to the upper half, said suspension comprising:

first means for suspension having a first connecting end operably coupled to the upper half of the support structure and having an opposite, first terminating end, said first suspension means being bent to form a first pivot area therein between said first connecting and terminating ends, said first means having a bar member and a transverse member, said bar member being attached between two linkage members, said transverse member being joined to said first means at said first connecting end, said transverse member engaging said bar member;

second means for suspension having a second connecting end attached to the lower half of the support structure and having an opposite, second terminating end, said second suspension means being bent to form a second pivot area therein between said second connecting and terminating ends; and

control means for weight adjustment extending between said

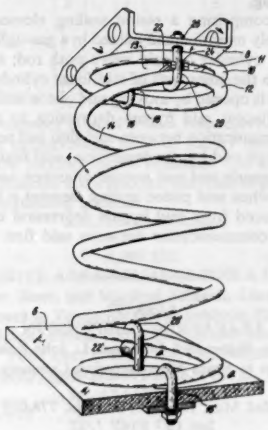
terminating ends to connect said first and second means, said first and second pivot areas abutting, said first means being rockable upon said second means at said pivot areas.

4,093,198

COIL SPRING DEVICE

Tom Lindhardt Petersen, Sodingevej 6, 5750 Ringe, Denmark

Continuation of Ser. No. 661,562, Feb. 26, 1976, abandoned.
This application May 12, 1977, Ser. No. 796,384
Claims priority, application Denmark, Feb. 26, 1975, 738/75
Int. Cl.[2] F16F *1/12*
U.S. Cl. 267—179 **12 Claims**



1. A device such as a playground toy, comprising a heavy coil spring, the opposed ends of which are affixed to respective opposed parts so as to render these parts mutually resiliently moveable by compression, expansion or bending of the coil spring, said spring at least at one end thereof having an outermost winding of small pitch and a following winding of increased or increasing pitch confining together with said outermost winding a helical wedge shaped space, a substantially non-compressible distance element being arranged in a portion of said wedge shaped space between and in engagement with respective winding portions, said distance element causing a first portion of said windings on one side of said distance element to be substantially locked at a mutual distance apart and said distance element causing a second portion of said windings on an opposite side of said distance element to maintain a minimum freespace both between said windings and adjacent the sides thereof of a size sufficient to prevent body appendages of a user from becoming jammed between said windings, and a substantially non-stretchable connector means being arranged adjacent said distance element so as to hold the respective winding portions in said engagement with the distance element and prevent the winding portions from being moved away from each other.

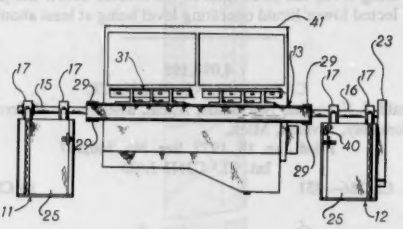
4,093,199

ROTATABLE ENGINE SUPPORTING APPARATUS

Paul Hefner, Billings, Mont., assignor to Ralph Stewart, Billings, Mont., a part interest

Filed Aug. 2, 1977, Ser. No. 821,225
Int. Cl.[2] B23Q *3/18*
U.S. Cl. 269—61 **10 Claims**

1. A rotatable engine supporting apparatus including a pair of spaced truncated bases, an engine supporting frame disposed between the spaced bases on rotatable shafts extending through pairs of bearing assemblies mounted on the upper surface of each of said bases, one of said shafts being driven by a gear reduction motor located in one of said bases through a chain and sprocket arrangement; said engine supporting frame being of a generally rectangular configuration with shorter end members affixed to the shafts and longer side members extending between the end members, said side and end members being edge-reinforced I beams welded together at the corners with overlay corner plate reinforcememts, said frame having



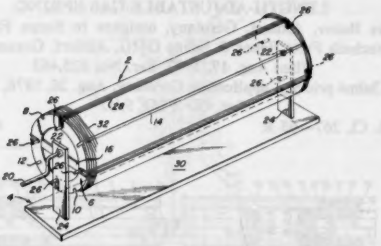
removable engine mounting brackets extending inwardly from each of said side members, each of said mounting brackets having an angle section with two faces engageable with said side member, a plurality of spaced connecting sections extending transversely from said angle section to an engine engaging section, said angle section and said engine engaging section having a plurality of openings along their lengths.

4,093,200

DEVICE FOR CUTTING YARN

George F. Ludvik, 9113 Rockefeller La., Springfield, Va. 22153

Filed Oct. 1, 1976, Ser. No. 728,560
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—295 **9 Claims**



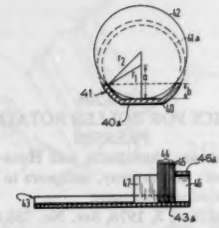
1. A device for cutting elongated material which comprises a drum having a plurality of axially disposed uniformly and equidistantly spaced, narrow grooves; said grooves being at least four in number; said material being disposed on said drum's surface, means for securing the material thereon, and comprising elastic band means mounted at opposite ends of the drum and spaced equidistant between adjacent grooves; base support means for rotatably supporting the drum, and including a pair of upright members rotatably receiving the drum, and said grooves being selected that when the material is cut by cutting means placed in selected ones of said grooves the material will be substantially equal in length.

4,093,201

DISC SUPPORT STRUCTURE

Wolfgang Dietze, Munich; Richard Mittermeier, Moosburg, and Gerhard Steinwagner, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 452,934, Mar. 20, 1974, Pat. No. 3,962,301. This application Dec. 8, 1975, Ser. No. 638,299
Claims priority, application Germany, May 7, 1973, 2322952
Int. Cl.² B23Q 3/00
U.S. Cl. 269—296 1 Claim



1. A support structure for supporting a plurality of crystal discs thereon during treatment of said discs, comprising:

an elongated tub-shaped body having an open top, said body being composed of a material selected from the group consisting of Si and SiC, said body having a flat continuous bottom wall and upwardly extending curved side walls integrally formed with said bottom wall and being curved in opposition relative to one another, and at least one strut integrally formed with said side walls and extending upwardly beyond the periphery of said side walls a distance greater than the radius of a disc to be supported on said structure so as to form a closed arc above said bottom wall and join said curved side walls to one another; and

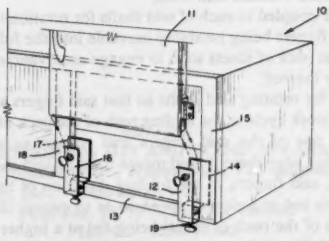
a movable block member composed of a material selected from the group consisting of Si and SiC, said block member being of a size fitting within said tub-shaped body to support a stack of said discs at a position within said support structure.

4,093,202

CABINET DOOR MOUNTING BRACKET

John E. Kincaid, 218 Center St., Kernersville, N.C. 27284

Filed Oct. 25, 1977, Ser. No. 845,328
Int. Cl.² B25B 5/14
U.S. Cl. 269—321 S 9 Claims



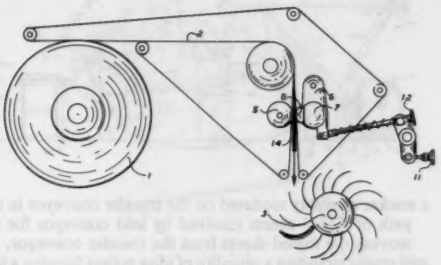
1. A door holding clamp comprising: a bracket, said bracket having first and second L-shaped sections, said L-shaped sections having leg and foot portions, said first and second L-shaped sections being joined in face-to-face relation to opposite ends on opposide sides of a vertical member, a support flange positioned on said leg portion of one of said L-shaped members and one of said L-shaped members having an adjusting means.

4,093,203

DEVICE FOR SLOWING DOWN PRINTING SPECIMEN IN THE FOLDING APPARATUS

Rudolf Fischer, Lu-Oggersheim, and Rudolf Frey, Dirmstein, both of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Germany

Filed Jul. 29, 1976, Ser. No. 709,749
Claims priority, application Germany, Sep. 17, 1975, 2541502
Int. Cl.² B41F 13/56
U.S. Cl. 270—20 5 Claims



1. Apparatus for slowing down fed printing specimens which are fed from a folding cylinder by means of a conveyor belt at a given speed before they are introduced into a paddle wheel of the folding apparatus in a rotary printing press, comprising:

a frame;

a pair of rollers supported on said frame and including a driven roller and a cooperating, freely pivotable roller forming a wedge portion therebetween interposed between said folding cylinder and said paddle wheel, the conveyor belt and the fed printing specimens passing through said wedge portion, said driven roller being fixed for rotation in said frame in synchronism with the fed printing specimens, said driven roller including on the outer periphery thereof at least two peripherally spaced rings forming therebetween a first aperture, said pivotable roller being movably coupled to said frame and adjustable for movement relative to said driven roller, said pivotable roller including on the outer periphery thereof a radially protruding bar running longitudinally therealong, said bar having at least one undercut portion forming a second aperture adapted to be aligned with said first aperture for providing a path through which said conveyor belt runs, said rollers being operable at a lower speed than that of said given speed of said conveyor belt, so as to reduce the impact speed of the specimens when they are introduced into said paddle wheel; and

adjustable means to adjust the distance between said pair of rollers, coupled to said pivotable roller, so as to permit adjustment relative to the thickness of said fed printing specimen.

4,093,204

SHEET CUTTER, FOLDER AND STACKER

Glenn A. Landgraf, and Fred H. Ebel, both of Boca Raton, Fla., assignors to Irvin Industries, Inc., Greenwich, Conn.

Filed Nov. 15, 1976, Ser. No. 741,566
Int. Cl.² B41F 13/56
U.S. Cl. 270—21 9 Claims

1. A sheet cutting, folding and stacking machine comprising

a cradle for supporting a roll of sheet material to be processed on the machine,

means for feeding the sheet material from a roll on the cradle to a cutting station,

a cutter including a hot wire forming part of the machine for cutting sheets of selected size from the roll,

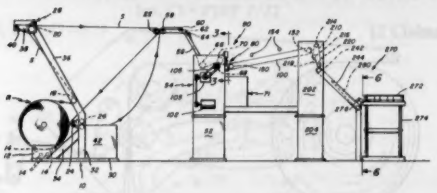
a folder approach conveyor disposed adjacent the cutter

station for receiving the cut sheet one at a time from the cutting station,

a folder mounted immediately adjacent the approach conveyor for receiving the sheets to be folded,

means including a pair of rollers and a blade forming part of the folder for making at least one fold in each sheet after its leaves the approach conveyor,

a transfer conveyor mounted adjacent the folder for receiving the folded sheets from the folder,



a stacker assembly mounted on the transfer conveyor in the path of folded sheets received by said conveyor for removing the folded sheets from the transfer conveyor,

said cradle including a plurality of idler rollers forming a bed to support the roll of sheet material,

driver rollers for engaging the sheet for pulling the sheet from the roll,

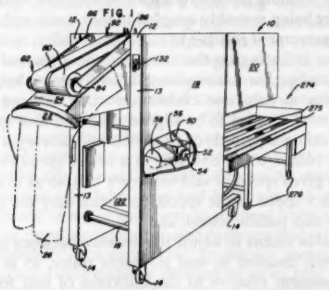
and a scray disposed between the wire cutter and drive rollers for temporarily collecting lengths of the sheet material prior to it being fed to the cutter.

4,093,205

FRENCH FOLDER CONSTRUCTION

Kasimir Kober, Chicago, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Filed Sep. 30, 1976, Ser. No. 728,080
Int. Cl.² B65H 45/22
U.S. Cl. 270—66 **6 Claims**



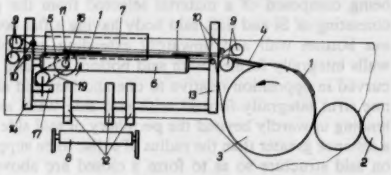
1. A folding apparatus comprising spaced parallel article support surfaces; having outermost parallel edges; the interval between said outermost edges of said support surfaces, defining an intervening effective article support surface; spaced support means for said opposed article support surfaces; a folding plate disposed beneath said support surfaces having parallel longitudinal edges; a first pivot mounted adjacent one end portion of said plate adjacent one longitudinal plate edge supportably mounting said plate for pivotal movement in a plane substantially parallel to said support surfaces; said folding plate parallel longitudinal edges being interconnected by a transverse article-engaging edge substantially traversing the interval between said outermost edges of said parallel support surfaces; motive means connected to said support means for said article support surfaces for uniformly moving said article support surfaces toward and away from each other in parallel relation; said motive means also being connected to said folding plate and simultaneously pivotally moving said folding plate about said pivot so that one of said folding plate longitudinal edges opposed to said pivot is maintained in substantial underlying alignment with the outermost edge of an overlying article support surface.

4,093,206

FOLDING DEVICE FOR ROLLER ROTATING PRINTING PRESSES

Karl-Heinz Hartmann, Lambsheim, and Hans-Günther Mayer, Frankenthal, both of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Germany

Filed Nov. 3, 1976, Ser. No. 738,410
Claims priority, application Germany, Nov. 5, 1975, 2549595
Int. Cl.² B65H 45/18
U.S. Cl. 270—67 **5 Claims**



1. A folding device for roller rotating printing presses for folding a prefolded pack of sheets which are fed in a folding path between a pair of endless conveyor belts in a direction parallel to and underneath a folding knife comprising:

a frame;

a generally U-shaped yoke including a horizontally extending base member and two arms secured to, and extending upwardly from opposite ends of said base member, said yoke being pivotably mounted on said frame for pivotable movement about a vertical axis, and such that said arms thereof are disposed on opposite sides of said folding knife;

a pair of horizontally-disposed rotatable shafts each of which is coupled to the upper end of one of said arms of said yoke for rotation about a horizontal axis, said shafts being disposed beneath said belts;

a finger coupled to each of said shafts for rotation therewith, said fingers being rotatably movable into the folding path of the pack of sheets so as to engage an advancing leading edge thereof;

means for rotating said shafts so that said fingers are moved in a work cycle in the folding path of the pack of sheets so that one of the said fingers will engage an advancing leading edge thereof, said means rotating said shaft and, in turn, said fingers, in the feeding direction of the pack of sheets but at a slower speed so as to permit the trailing edge of the pack of sheets being fed at a higher speed by said belts, to become properly aligned with the leading edge; and

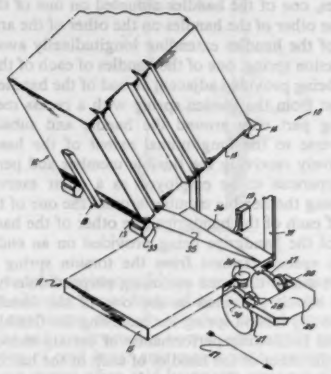
means for pivoting said yoke so as to, in turn, move one of said fingers toward the leading edge of the pack of sheets for engagement therewith, the other finger remaining in a non-engagement position relative to the pack of sheets until such time that the trailing edge of the pack of sheets becomes properly aligned with the leading edge thereof.

4,093,207

MAGAZINE AND FEEDER FOR CARTON BLANKS

Joseph Daniel Greenwell, Florence; Charles C. Hughes, and Robert W. Kinney, both of Ludlow, all of Ky., assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Dec. 1, 1976, Ser. No. 746,466
Int. Cl.[2] B65H *1/30, 3/30*
U.S. Cl. 271—3.1 3 Claims



1. In a carton blank feeding mechanism
a magazine lower stage,
a blank ejecting mechanism located below the lower stage,
a magazine upper stage located immediately above the lower stage and being inclined to the vertical, and
a pair of transversely spaced feed rollers located between the upper and lower stages, said rollers forming the sole support for carton blanks mounted in the upper stage of said magazine,
the upper stage of the magazine having one wall which is at an angle of approximately 30° to the vertical,
the axes of said rollers defining a plane lying at an angle of approximately 105° to said inclined wall,
whereby cartons loaded in said upper stage and resting on said rollers will be shingled with respect to each other.

4,093,208

CHILD'S RIDING TOY AND STAND APPARATUS

William R. Tomalinas, Jr., Wapwallopen, Pa., assignor to Roth American, Inc., Wilkes-Barre, Pa.

Filed Jan. 18, 1977, Ser. No. 760,405
Int. Cl.[2] A63G *17/00*
U.S. Cl. 272—52.5 7 Claims

4. A stand apparatus for a riding toy supported from fixed positions thereon, comprising:
an elongated member formed in a closed curve;
means for resiliently supporting the riding toy in the horizontal plane within the closed curve of the elongated member from fixed locations on the member;
a pair of inverted, generally U-shaped frames, detachably mounted to sides of the elongated member, for supporting the apparatus on a supporting surface; and

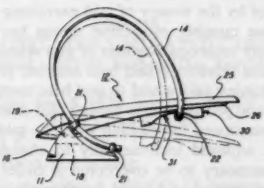
casters, detachably mounted to ends of said U-shaped frames.

4,093,209

DIVING APPARATUS

Lewis J. Daly, Fayetteville, N.Y., assignor to Robert C. Stevens, Pittsford and John M. Loftus, Scottsville, both of, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,059
Int. Cl.[2] A63B *5/10*
U.S. Cl. 272—66 10 Claims



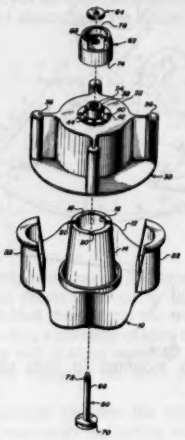
7. A self-adjusting diving platform of relatively short length including:
base member;
a board pivotally mounted at one end to said base member;
a pair of spaced apart arcuate shaped spring members secured in cantilevered fashion at one end in the base member and extending outwardly from said base each spring member extending along an edge of the board;
a crossbar secured to the free ends of said spring members said crossbar extending transversely and beneath the board; and
at least one arcuate guide slide means affixed to the bottom surface of the board and extending substantially longitudinally the board and having a generally concave working surface formed therein for receiving and guiding the crossbar in sliding relationship therewith when said board is used by a person, in rearward movement of the crossbar when the board is loaded to a predetermined level and to resist rearward movement of the crossbar when the board is loaded beyond said predetermined level.

4,093,210

FINGER/ARM FRICTION TYPE EXERCISING DEVICE

George I. Terpening, Telford, Pa., assignor to Acro Matic, Inc., Warrington, Pa.

Filed Jun. 3, 1977, Ser. No. 803,149
Int. Cl.[2] A63B 23/00, 21/26, 21/30
U.S. Cl. 272—67 6 Claims



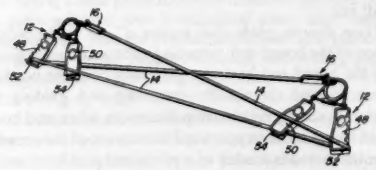
1. An exercising device adapted to strengthen the deep and superficial muscles of the forearm, comprising
   1. a base member for attachment to a wearer's waist, said base member having
      a. a projection means perpendicular thereto for receiving a wheel rotatable thereon, and
      b. means for attaching said base member to a wearer's waist;
   2. a wheel telescopically mounted for rotation on said projection, means said wheel having
      a. a plurality of radial projections to initiate rotation thereof by the wearer of said exercising device;
   3. said base member projection means having means for selectively receiving portions of said wheel to rotation of said wheel relative to said base member projection; and
   4. means joining said wheel to said base member projection means, said joining means having said selective receiving means positioned therewithin whereby said joining means may be adjusted incrementally to change the resistive force necessary to be overcome in order to rotate said wheel relative to said based member projection means.

4,093,211

COMBINATION JUMP ROPE AND FLEXIBLE EXERCISER

Thomas E. Hughes, 5908 Ridgewood Rd., Jackson, Miss. 39211, and Thomas E. Skornschek, 618 Ashcroft Dr., Brandon, Fla. 33511

Filed Feb. 4, 1977, Ser. No. 766,053
Int. Cl.[2] A63B 5/20, 21/14, 21/30
U.S. Cl. 272—68 4 Claims



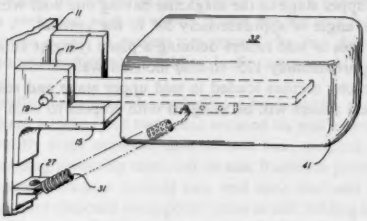
1. In an exercising apparatus, comprising, in combination:
   a. a pair of handgrips;
   b. an elastic, flexible member having two spaced ends connected to the handgrips, with the member being arranged extending between the handgrips; and
   c. fastening means attached to the handgrips for attaching the ends of the flexible member to the handgrips; the improvement wherein:
   d. each of the handgrips is resilient and includes a torsion spring provided with normally diverging arms, and two handles, one of the handles mounted on one of the arms and the other of the handles on the other of the arms, and each of the handles extending longitudinally away from the torsion spring, one of the handles of each of the handgrips being provided adjacent an end of the handle spaced farthest from the torsion spring with a recess means extending part way around the handle and substantially transverse to the longitudinal extent of the handle for selectively receiving the flexible member and permitting the apparatus to be employed as a chest exerciser by wrapping the flexible member around the one of the handles of each of the handgrips, the other of the handles of each of the handgrips being provided on an end of the handle spaced farthest from the torsion spring with a groove means disposed extending perpendicularly to the recess means provided in the one of the handles and toward the torsion spring for receiving the flexible member and facilitating performance of certain exercises by using the other of the handles of each of the handgrips as a fulcrum for the flexible member.

4,093,212

PUNCHING BAG FOR PRACTICING UPPERCUTS

Ronald Harmon Jacques, 15 E. Bunns La., Woodbridge, N.J. 07095

Filed May 12, 1976, Ser. No. 685,630
Int. Cl.[2] A63B 69/00
U.S. Cl. 272—76 10 Claims



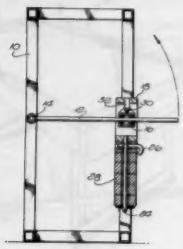
1. A training device for fighters permitting the practice of uppercut punches comprising:
   a. a mounting member for attachment to the wall of a room in which training is to take place said member arranged to be vertically disposed thereon;
   b. an arm having padding attached on all sides thereof and presenting at its outer end a portion simulating the chin of a fighter;
   c. an angle bracket rigidly attached to said mounting member;
   d. first and second side members rigidly attached to said mounting member and to said angle bracket said side members each having a hole formed therein; and
   e. a rod rigidly attached to the end of said arm disposed in said holes for rotation therein;
   f. means for limiting the downard motion of said padded arm to an approximately horizontal position such that the bottom portion of the padding on the end of said arm, when said mounting member is attached to the wall, will be approximately at the height of a man's chin; and
   g. means biasing said padded arm downward to said approximately horizontal position.

4,093,213

VARIABLE RESISTANCE LIFTING MECHANISM

Charles Milton Coker, Huntington Beach, and Gary Marvin Kling, Fullerton, both of Calif., assignors to Paramount Health Equipment Corp., Los Angeles, Calif.

Filed Feb. 10, 1977, Ser. No. 767,412
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—118 5 Claims



1. A variable resistance lifting mechanism, comprising:
a frame having means for guiding the movement of weights:
lever arm means pivotally attached to said frame at a pivot point and constructed to permit substantially only reciprocation of said lever arm means with respect through a sleeve means when said lever arm means is pivoted by a user
a pivotable, linear bearing sleeve means for receiving said lever arm means in telescoping relationship, said sleeve means being mounted at a position remote from said lever arm means pivot point, said sleeve means being mounted for linear movement within said guide means and for simultaneous pivotal with respect to said frame to maintain alignment with said lever arm, said sleeve means simultaneously distributing a user's lifting forces over a substantial length of the respective lever arm means during lifting of the lever arm means
bar weight supporting means pivotally connected to said each linear bearing sleeve means;
a plurality of weights slidably mounted for linear movement of said guide means, said weight having adapted to distribute the forces against said guide means over a length of said guide means; and,
means for attaching a selected number of said weights to said bar means,
whereby pivoting by a user of said lever arm means about its pivot point causes pivoting said linear bearing sleeve means with respect to said guide means and simultaneous linear movement of said sleeve means and of said weights on said guide means.

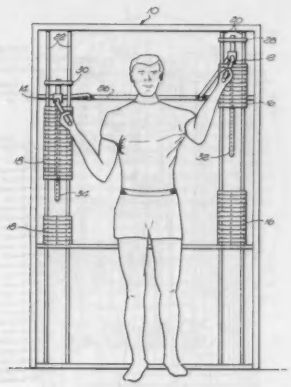
4,093,214

DUAL FUNCTION EXERCISE MACHINE

Charles Milton Coker, Huntington Beach, and Cliff James Coker, Calabasas, both of Calif., assignors to Paramount Health Equipment Corp., Los Angeles, Calif.

Filed Feb. 10, 1977, Ser. No. 767,411
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—118 4 Claims

1. A dual function exercise machine, comprising:
a frame having means for guiding the movement of weights:
a plurality of separate and independent adjacent lever arm means pivotally connected to said frame for lifting separate stacks of weights by a user;
pivotable, linear bearing sleeve means for receiving each said lever arm means, each said sleeve means mounted at a position remote from each said lever arm means pivot point said each sleeve being mounted for linear movement with respect to said guide means and for simultaneous rotation with respect to said frame to maintain alignment with the respective lever arm means, each said sleeve means being adapted to simultaneously distribute lifting forces over a substantial length of each of the respective lever arm means;
bar means pivotally connected to said each linear bearing sleeve means;
a plurality of separate and independent stacks of weights, each stack of weights being slidably mounted for linear movement on said guide means and associated with one of said lever arm means; and,



securing means adapted to secure each one of said bar means to a selected number of weights in an associated stack,
said lever arm means being so situated on the frame as to permit exercise by one or both corresponding user's limbs on adjacent lever arm means connected to the same or a different number of weights and rotation by a user of said lever arm means causing rotation of an associated linear bearing sleeve means with said lever arm and simultaneous linear movement of said sleeve means and of said selected number of weights on said guide means.

4,093,215

CHANCE OPERATED SIMULATED CARD GAME

Chester P. Ballard, 1219-41 Barham Dr., San Marcos, Calif. 92069

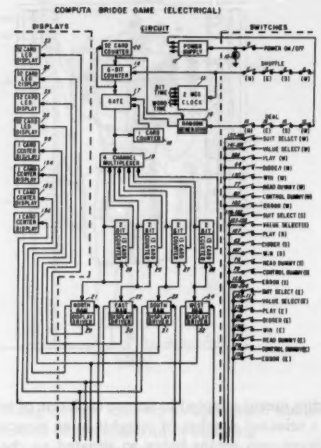
Filed Jun. 4, 1976, Ser. No. 693,276
Int. Cl.[2] A63F *1/18*
U.S. Cl. 273—1 E 4 Claims

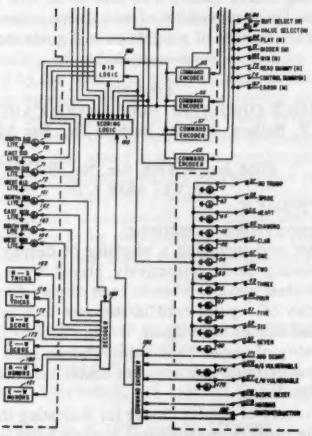
1. A game system, comprising:
a center unit including a plurality of display devices for indicating cards respectively played by a plurality of individual players, wherein each display device provides display of a given card in response to a predetermined center display code signal;
a plurality of player hand units, wherein each player hand unit is coupled to a separate center unit display device, and includes
a plurality of display device for indicating the identity of the cards in an individual player's hand in response to predetermined hand display code signals representing different cards, and
switch means for selecting a card for display in the center unit display device coupled to said player hand unit;
means responsive to said selection of a card for providing a said predetermined center display code signal to the center unit display device coupled to said player hand unit; and
means for randomly distributing a predetermined number of said hand display code signals to each player hand unit; wherein the distributing means comprise
a plurality of RAM's, each separately coupled to each of the

player hand units, wherein each RAM provides said predetermined hand display code signals in response to being addressed by different hand card code signals having different counts;

a counter for providing a succession of hand card code signals having different counts;

a multiplexer connected to the RAM's for receiving said hand card code signals and distributing said received hand card code signals to separate RAM's;





means for randomly providing said hand card code signals from the counter to the multiplexer; and

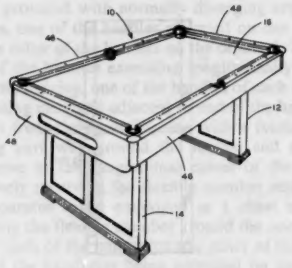
a plurality of card counters each of which is coupled to the multiplexer and to a given RAM for counting the number of hand card code signals provided to said given RAM and for inhibiting further distribution of said hand card code signals to said given RAM upon counting that a predetermined number of hand card code signals have been distributed to said given RAM.

4,093,216

POOL TABLE CONSTRUCTION AND ITS METHOD OF CONSTRUCTION

Ronald Lee Dunn, 2823 Knode Ct., Fort Wayne, Ind. 46806

Filed Apr. 13, 1977, Ser. No. 786,970
Int. Cl.[2] A63B *15/00*
U.S. Cl. 273—6 **7 Claims**



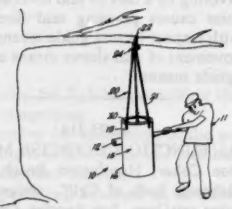
1. A pool table construction comprising a substrate of wood extending substantially throughout both the length and width of the playing area of the pool table and forming a complete underlayer which provides a support for the playing surface, and a substantially flat sheet of tempered glass having strength of from about 15,000 to about 35,000 psi and which overlies said supporting substrate of wood to provide the playing surface for the pool table, and including cutouts at the four corners and midsides of said flat sheet of tempered glass, a fabric covering for said glass which lies flatly against the playing surface of the glass and provides the playing surface of the pool table, a series of rails surrounding said tempered glass to confine the pool table operation to the playing area, and a plurality of spaced pockets at the four corners and two midsides of said pool table and corresponding with said cutouts formed in said flat sheet of tempered glass.

4,093,217

BATTING PRACTICE DEVICE

Silvio D. Piccini, 13620 SW. 74th Ct., Miami, Fla. 33158

Filed Mar. 15, 1976, Ser. No. 667,164
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 R **14 Claims**



1. A batting practice device comprising, in combination,

an open ended hollow cylinder,

said cylinder being formed of an elastomeric material,

a sling for said cylinder,

said sling including at least three support members,

support means for securing said support members at a position above the cylinder for swingably supporting said cylinder above a surface,

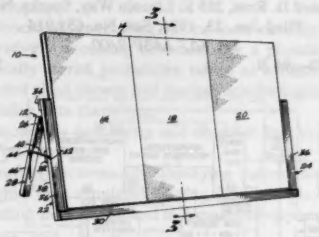
said cylinder having the properties of resilience and resistance to deformation under the blow of a bat to simulate the striking of a ball with a bat similar to a reinforced rubber tube of at least two plies and weighing at least ten pounds per foot, whereby a batter can practice repetitive swing at a strike area on said cylinder.

4,093,218

MODULAR BALL REBOUND APPARATUS

Samuel A. Burchers, 1910 Jamaica Way, Punta Gorda, Fla. 33950

Filed Nov. 26, 1976, Ser. No. 745,417
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A 1 Claim



1. A portable ball rebound apparatus comprising
at least three ball rebound panels each having a planar surface of a shock absorbing material,
means to removably support said rebound panels,
said means to support said rebound panels comprising an easel including a pair of opposed, spaced apart front legs interconnected by a plurality of transverse parallel rails of a length to removably support said three rebound panels, and a pair of side rear legs hingedly connected at their upper ends to the respective front legs,
means to adjust said means to support in a manner so as to selectively position said planar surface at various selective angles of inclination to the vertical,
each of said rebound panels comprising a rigid backing sheet with a cellular synthetic material bonded thereto comprising shock absorbing material, and
wherein said plurality of transverse parallel rails comprises a bottom rail fixed between the bottom ends of said front legs, each of said rebound panels being notched across its bottom edge in a manner so as to fit behind and on top of said bottom rail, and intermediate and top rails fixed between said front rails in positions to supportingly engage the back of each of said rebound panels.

4,093,219

BALLS FOR SPORT

Jean-Daniel Piraud, Thiers, France, assignor to Societe de Transformation du Caoutchouc-Sotrac, Cournon, France

Filed Oct. 22, 1976, Ser. No. 734,935
Claims priority, application France, Oct. 30, 1975, 75 33174
Int. Cl.[2] A63B *41/02*
U.S. Cl. 273—65 B 2 Claims

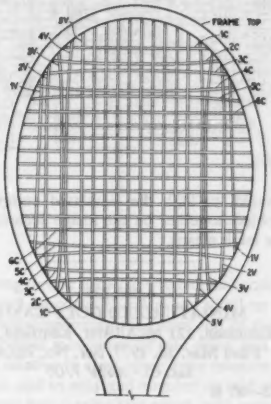
1. A two-ply ball for use in sports activities, consisting of an external cover layer fabricated of a wear-resistant material surrounding and secured to a composite bladder/body forming the inner layer in the ball, said composite bladder/body layer being fabricated from an elastomeric resin comprising a polycondensation product of at least one compound of the group consisting of the dicarboxylic acids and esters of the dicarboxylic acids having a molecular weight of less than 300 with a polyalkylene-oxyglycol whose molecular weight is between 400 and 6,000, and at least one diol having a molecular weight of less than 250.

4,093,220

TENNIS RACKET STRING NETWORK

Mike Prewarski, 3432 Lansdowne Dr., Lexington, Ky. 40502

Filed Oct. 28, 1976, Ser. No. 736,585
Int. Cl.[2] A63B *51/00*
U.S. Cl. 273—73 D 6 Claims



1. A racket comprising:
a frame defining a central opening;
a handle extending outwardly from said frame;
first string means forming a plurality of longitudinal strings extending in the direction of said handle, spaced over the central opening and attached to said frame under tension;
second string means forming a plurality of cross strings extending at right angles to the first string means, spaced over the central opening and attached to said frame under tension;
a plurality of centrally located strings of the first and second string means being interwoven in the conventional basket-weave pattern and forming an imaginary center striking area bounded by longitudinal side strings and cross end strings;
the cross strings spaced from the longitudinal side strings being interwoven over and under at least two longitudinal strings with consecutive cross strings alternating the over and under pattern; and
a plurality of cross strings spaced from at least one end of the cross end strings being interwoven with a plurality of longitudinal strings in an identical predetermined pattern.

4,093,221

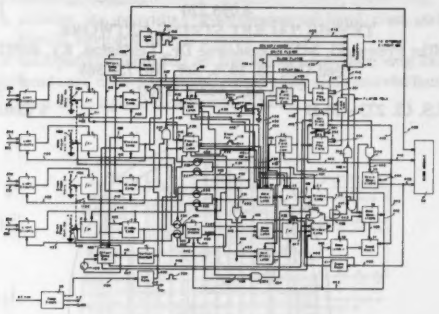
SIMULATED VIDEO GAME

Glen R. Dash, Watertown, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 13, 1976, Ser. No. 750,055
Int. Cl.[2] A63F *7/06*; G08B *5/22*; H04N *7/18*
U.S. Cl. 273—85 G 49 Claims

49. For use in an electronic game wherein simulated images are produced on the image screen of a CRT having a raster scan beam, electronic controller means operable to produce on said image screen the simulation of a playing area or region of the game, the simulation of at least one active component of said game, and the simulation of an object that moves about the playing area or region, said electronic controller means including, in combination, component signal generating means to provide an active component signal that serves to generate on the image screen the simulated active component, object generating means that serves to generate said object on the image

screen, latch means connected to receive the active component signal and the object signal and adapted to note the coincidence of the active component signal and the object signal and,



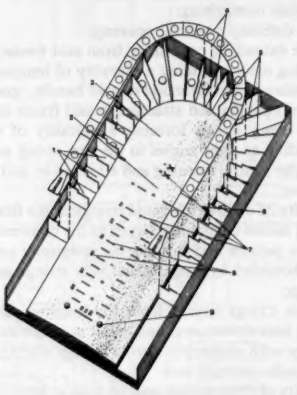
when activated, to lock the simulated component and the simulated object together on the image screen, and means to activate the latch means.

4,093,222

MINIATURIZED GOLF GAME

Robert C. Eshleman, 221 McAllister, Kentfield, Calif. 94904

Filed Mar. 23, 1977, Ser. No. 780,403
Int. Cl.[2] A63F 7/06
U.S. Cl. 273—87 R **8 Claims**



1. A skill game simulating in miniature the playing of golf comprising:

a miniature golf ball;

a contoured game board having a plurality of slots arranged in a "U"-shaped configuration around a playing area convexly contoured with the apex thereof lying on the centerline of said "U" to arcuately accelerate said ball rolling thereon away from said centerline simulating hook and slice;

designator means for associating golf shots of particular distances and directions with each of said slots, the distances of the golf shots being generally inversely related to the distances from the associated slots to said centerline, the directions of the golf shots associated with the slots on the legs of said "U" being primarily hooks and slices respectively;

at least one miniature golf club for manual striking of said ball for movement on said contoured game board;

a map depicting in miniature a golf course; and

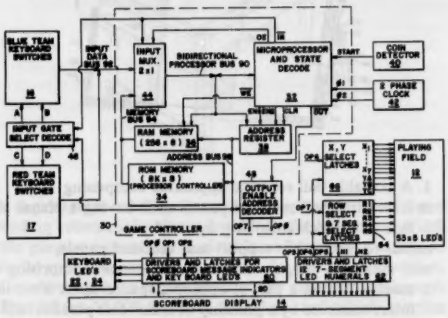
scaling means for translating the golf shots associated with said slots into corresponding movement on said map to simulate the playing of golf on the course depicted on said map by skilled manual manipulation of said ball on said contoured game board.

4,093,223

ELECTRONIC GAME APPARATUS AND METHOD

William F. Wilke, 702 N. Minnesota St., Carson City, Nev. 89701; Alan G. Hutcheson, 349 Smithridge, Reno, Nev. 89502, and Richard D. Ross, 285 E. Lincoln Way, Sparks, Nev. 89431

Filed Jan. 23, 1976, Ser. No. 651,914
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—94 R **24 Claims**


BLUE TEAM KEYBOARD SWITCHES
INPUT DATA BUS 96
INPUT MUX. 2 x 1
BIDIRECTIONAL PROCESSOR BUS 90
MICROPROCESSOR AND STATE DECODE
START
COIN DETECTOR 40
3 PHASE CLOCK 42
INPUT GATE SELECT DECODE
RAM MEMORY (256 x 8) 36
ADDRESS REGISTER 38
PLAYING FIELD 12
RED TEAM KEYBOARD SWITCHES 17
ROM MEMORY (8K x 8) PROCESSOR CONTROLLER 34
OUTPUT ENABLE ADDRESS DECODER
ROM SELECT & TEST SELECT LATCHES
GAME CONTROLLER
55 x 5 LED'S
KEYBOARD LED'S 22 - 24
DRIVERS AND LATCHES FOR SCOREBOARD MECHANIC INDICATORS AND KEY BOARD LED'S
DRIVERS AND LATCHES FOR 7- SEGMENT LED NUMERALS
SCOREBOARD DISPLAY 14

1. An electronic game apparatus comprising:

a simulated playing field including automatically controllable indicia means for displaying game ball position and play execution movement;

scoreboard display means including automatically controllable indicia means for displaying game data;

first means for manually inputting a selected one of a plurality of play choices by a player presently on offense;

second means for manually inputting a selected one of a plurality of play choices by a player presently on defense;

game controller means including microprocessor means, random access memory means, and read-only memory means, wherein one portion of said read-only memory means includes probability table means comprising a plurality of stored electrical states arranged such that said states represent odds of success for different parameters involved in each play choice, and wherein a second portion of said read-only memory means includes a processor controller comprising a plurality of stored electrical states, said game controller means operating to detect input play choices and operating to generate a random number in response thereto, said processor controller operatively enabling said microprocessor means in conjunction with said random access memory means to automatically selectively access a plurality of said states in said probability table means based on the play choice of the offensive player, the play choice of the defensive player, and based on said random number, the accessed states of said probability table means constituting a specific play outcome;

clock generator means, said clock generator means acting in conjunction with said microprocessor means and said random access memory means of said game controller means to use said play outcome to automatically generate a play execution;

means for enabling said game controller to automatically control said playing field indicia means such that in real time said generated play execution is displayed, wherein the game ball is displayed as moving from an initial position on said playing field to a position corresponding to that determined by said play outcome; and

means for automatically updating said scoreboard display means under the control of said game controller means

such that the current status of the game is continuously maintained thereon.

14. A method for electronically simulating the strategy of an athletic contest from electrical signals selected by competing players representing chosen offensive and counteracting defensive plays of said athletic contest comprising the steps of:

a. electronically detecting said signals representing said chosen offensive play and said chosen counteracting defensive play;

b. electronically generating one or more random numbers;

c. operatively accessing automatically a plurality of electronically stored probability tables as a function of the detected plays chosen and random numbers generated, for obtaining data therefrom;

d. electronically processing said obtained data to generate a play outcome; and

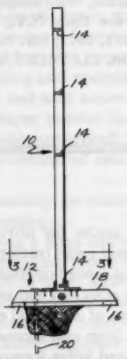
e. thereafter electronically displaying automatically and in real time on a simulated playing field said play outcome, including the location and movement of opposing players.

4,093,224

NET HOLDING STANCHION ASSEMBLY

C. Marion Hale, 8525 Colesville Rd., Silver Spring, Md. 20910

Filed Mar. 9, 1976, Ser. No. 665,444
Int. Cl.² A63B *61/00*
U.S. Cl. 273—95 H **3 Claims**



1. A net holding stanchion assembly comprising: a vertical support member having a plurality of net fastening members secured thereto at predetermined heights;

a base member having a pair of spaced apart parallel ground engaging support members disposed parallel to the direction of a net when connected to the stanchion assembly, a pair of spaced apart parallel cross members fixedly secured at each end thereof to the central portions of the ground engaging support members, the vertical support member being releasably secured in the upright position between the cross members in their central portions;

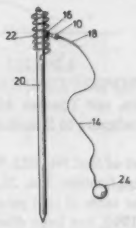
T-shaped spike means engagable with the upper surfaces of the cross members and extendable into the ground between the cross members so as to anchor the stanchion assembly to the ground during use.

4,093,225

ANCHORING DEVICE FOR CAPTIVE BALL AND CORD FOR A GAME

Robert John Oliver, Adelaide, Australia, assignor to Zimm-Zamm Aktiengesellschaft, Zurich, Switzerland

Filed Oct. 5, 1976, Ser. No. 729,775
Claims priority, application United Kingdom, May 20, 1976, 20955/76
Int. Cl.² A63B *69/00*
U.S. Cl. 273—95 AA **2 Claims**



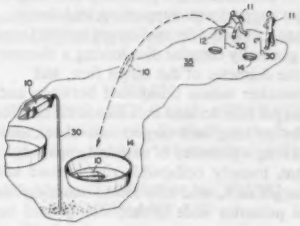
1. An anchoring device for a captive ball and cord in a game comprising a stand supporting a spiral and a ball on one end of a cord, means interconnecting the other end of the cord and the spiral for vertical movement of said spiral and said other end of the cord relative to each other upon rotation of the ball around the stand, and an enlarged member on said other end of said cord adjacent but outside said spiral, said enlarged member having a diameter greater than the distance apart of the coils of the spiral so as to prevent the cord from becoming snagged in the coils of the spiral and to provide a prominent visual indication to the players of the game of the relative position of the cord and the spiral.

4,093,226

DINKEY GAME

Robert W. Priestle, Highland Heights, Ky., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,809
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 F **1 Claim**



1. A competitive game of skill and luck comprising a paddle, an object that is struck by the paddle to cause it to fly towards a goal, and

a cradle for retaining the object in an elevated position above the ground prior to being struck, in which

the object is a block of square cross-section formed at each of two opposing ends with a pyramid like tapered section, in which

the paddle is formed of a handle fitted to a plate bounded by a pair of parallel surfaces that are joined along one side by a tapered section that extends to a rounded edge, and

the cradle is formed of a continuous length of bent wire shaped with a straight shank section that serves as a vertical stake, joined at its upper extremity to a container

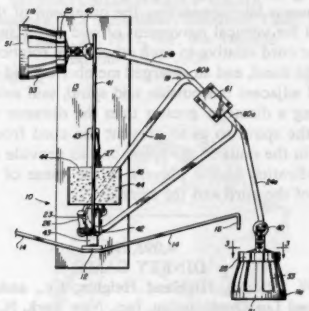
section, said container section formed to fit about the bottom and a pair of opposed sides of the said object and of a length shorter than that of the object, with said container section open at each end and open to the top of the container section, so that the opposed end section of the object may extend beyond the opposed ends of the container section, to permit a player to strike with the paddle, one projecting end of a said object resting in the container section, so as to permit the other end of the object when so struck to freely pivot and to permit the object to freely rise above the container after being so struck by the paddle.

4,093,227

TARGET WITH IMPROVED SHOCK ABSORBER MEANS

Charles A. Saunders, and Thomas Allen Saunders, both of Columbus, Nebr., assignors to Saunders Archery Co., Columbus, Nebr.

Continuation-in-part of Ser. No. 623,793, Oct. 20, 1975, Pat. No. 3,979,118. This application Jun. 28, 1976, Ser. No. 700,194
The portion of the term of this patent subsequent to Sep. 7, 1993, has been disclaimed.
Int. Cl.[2] F41J *7/04*
U.S. Cl. 273—102.1 E **7 Claims**



5. A marksmanship target assembly comprising

an impact target producing a visible reaction to missile impacts and including a generally disk shaped target face, a target support arm supporting said target,

hub means supported by said target support arm and including a generally circular disc having a diameter no greater than the diameter of the target face, and

shock absorber means interposed between and connecting said target face to said hub means to cushion impacts of missiles striking said target, said shock absorber means comprising a plurality of annularly spaced, longitudinally resilient, linearly collapsible ribs formed integrally with said target face, said hub means securing rearwardly directed posterior ends of said ribs to said target support arm.

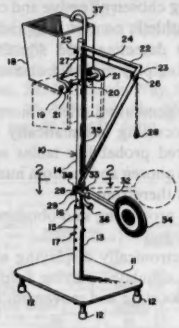
4,093,228

WATER DUMPING TARGET GAME

Franklin K. Pierce, 14220 SW. 74th St., Miami, Fla. 33183

Filed Jun. 27, 1977, Ser. No. 810,416
Int. Cl.[2] F41J *7/00, 5/00;* **A63B** *71/06*
U.S. Cl. 273—102.1 G **3 Claims**

1. A water dumping toy comprising a platform, support means extending upwardly of said platform, a water bucket, horizontally disposed pivot means supporting said water bucket on said support means, a lanyard, means securing an end of said lanyard to said bucket, said lanyard having a loop portion at the other end, a pin mounted on said support means receiving said loop portion and maintaining said water bucket in an upright position, a target arm, a target mounted at one end of said arm, pivot means mounting the other end of said target arm in proximity of said pin and release means mounted on said target engaging said loop whereby upon the swinging



of said target about said pivot means said loop is removed from said pin and said water bucket is compelled to pivot about said horizontally disposed pivot means and dump the water in said water bucket.

4,093,229

GAME TRACING ARROW

Richard C. Kelling, Grafton, Wis., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sep. 1, 1977, Ser. No. 829,608
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 R **2 Claims**

1. A game tracing arrow for providing a trail for game struck by the arrow, said game tracing arrow comprising

a hollow shaft having spaced opposite first and second ends, said shaft opening at its first end and being filled in so that it is solid in the area of its second end for a predetermined part of the length from said second end, said shaft having equiangularly spaced holes formed therethrough around the circumference thereof where said shaft is hollow but next-adjacent the solid part thereof;

a trail-indicating dye material in the shaft;

feathers on the shaft extending from the area of the second end thereof where said shaft is solid;

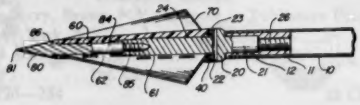
a piston member coaxially movably mounted in the shaft at the first end thereof and extending a predetermined distance out of said first end and a predetermined distance into said shaft; and

a head part on the piston member at the end thereof extending out of the first end of the shaft whereby when the arrow strikes a target the impact with the target forces the piston member back into the shaft thereby causing the dye material to gradually drip to the ground via the holes through the shaft to mark the trail of the target.

4,093,230
ARROWHEAD

Miroslav Andrew Simo, Riverside, Ill., assignor to New Archery Products Corp., Riverside, Ill.

Continuation-in-part of Ser. No. 619,824, Oct. 6, 1975, Pat. No. 4,006,901. This application Nov. 2, 1976, Ser. No. 738,030
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.² F41B 5/02
U.S. Cl. 273—106.5 B 34 Claims



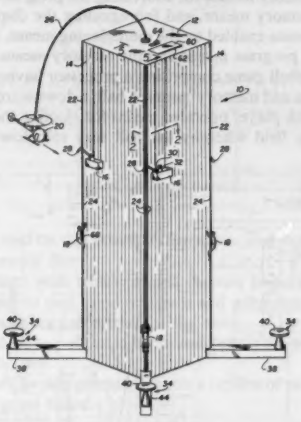
20. An arrowhead assembly comprising:
an arrow shaft having a head end, an adapter shaft having a head end and an other end, said adapter shaft provided by shaping said arrow shaft head end and having means for fastening a nosepiece at said adapter shaft head end;
an arrowhead body forming a hollow cylinder, said hollow cylinder having a diameter greater than said adapter shaft providing freely rotatable movement when said adapter shaft is inserted in said hollow cylinder, multiple blades firmly mounted within said body and having a shape exterior to said arrowhead body adapted for good aerodynamic flight characteristics and deep target penetration, the forward end of said arrowhead body having forwardly reducing diameter taper; and
a tapered nosepiece having a fastening means at its tail end for mating with said fastening means in the head end of the adapter shaft fastening said nosepiece in fixed relation to said adapter shaft and said arrow shaft, said nosepiece having a hollow taper portion to receive said tapered forward end of said arrowhead body while allowing freely rotatable movement of said arrowhead body and blades.

24. An arrowhead assembly for attachment to the head end of an arrow shaft comprising:
an adapter shaft having a head end and an other end, said other end having fastening means for securement to said head end of an arrow shaft and means for fastening a nosepiece at said adapter shaft head end;
an arrowhead body forming a hollow cylinder, said hollow cylinder having a diameter greater than said adapter shaft providing freely rotatable movement when said adapter shaft is inserted in said hollow cylinder, multiple blades firmly mounted within said body and having a shape exterior to said arrowhead body adapter for good aerodynamic flight characteristics and deep target penetration;
a tapered nosepiece having a fastening means at its tail end for mating with said fastening means in the head end of the adapter shaft fastening said nosepiece in fixed relation to said adapter shaft and said arrow shaft while allowing freely rotatable movement of said arrowhead body and blades; and
a protective sheath covering the blades, said sheath comprising an exterior wall the shape of a truncated cone having a large end which when in place extends rearwardly beyond the blades and an opposite small end which when in place extends forwardly beyond the blades, multiple fins extending inwardly from said exterior wall for a distance so that the fin ends engage said arrowhead body.

4,093,231
SUPERFLY GAME APPARATUS

John Gleason, 125-10 Queen Blvd., Kew Gardens, N.Y. 11415

Filed Aug. 3, 1977, Ser. No. 821,617
Int. Cl.² A63F 9/00
U.S. Cl. 273—108 10 Claims



1. Superfly game apparatus comprising in combination:
a simulated building structure having side walls and a roof;
a scaffold carried by each of said side walls having means thereon pivotable to a location approximate the adjacent corner of the structure;
a simulated helicopter mounted on said roof for rotation about the structure;
a series of playing pieces each configured in the representation of a human figure and positionable on the respective corners of the structure for movement therealong;
retaining means on said structure cooperable with said playing pieces for retaining said pieces at different elevational levels;
and manually operable means for propelling said playing pieces vertically along the corners of said structure.

4,093,232
PLAYER OPERATED GAME APPARATUS

David J. Nutting, and Jeffrey E. Frederiksen, both of Milwaukee, Wis., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed May 13, 1975, Ser. No. 576,980
Int. Cl.² A63F 7/00
U.S. Cl. 273—121 A 55 Claims

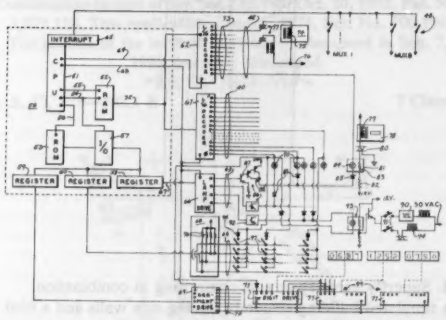
1. A game apparatus comprising:
a processor having program means for programming the processor and memory means for storing signals;
a physical mass capable of motion;
player-operated control means for affecting the motion of the physical means;
a plurality of response means for detecting the mass, each response means having signaling means associated therewith and operatively connected to the processor for signaling the processor that the response means has detected the mass;
a plurality of display means for presenting information based upon the detection of the mass by the response means, each display means having a display activation means associated therewith and operatively connected to the

processor for activating the display means in response to a signal from the processor; and

multiplexing means operatively connected to the processor for cyclicly and sequentially enabling each of the signaling means to signal the processor that its associated response means has detected the mass, and for cyclicly and sequentially enabling each of the display activation means to activate its associated display means;

said processor having means for storing the signals from the signaling means enabled by the multiplexing means into the memory means, for addressing the program means and the memory means, and for signaling the display activation means enabled by the multiplexing means, in response to the program means and the memory means.

45. A pinball game comprising a processor having programming means and memory means; a ball; a downwardly inclined playing field; player operated means for ejecting the ball on to the playing field whereby the ball may roll downwardly; a



plurality of response means for detecting the ball and having signaling means associated therewith and operatively connected to the processor for signaling the processor that the response means has detected the ball; a plurality of display means for presenting information based upon the detection of the ball by the response means and having display activation means associated therewith and operatively connected to the processor for activating the display means in response to a signal from the processor; and multiplexing means operatively connected to the processor for cyclicly and sequentially enabling the signaling means to signal the processor that its associated response means has detected the ball, and for cyclicly and sequentially enabling the display activation means to activate its associated display means; said processor having means for storing the signals from the signaling means enabled by the multiplexing means in the memory means, for addressing the program means and the memory means, and for signaling the display activation means enabled by the multiplexing means, in response to the program means and the memory means.

4,093,233

GOLF GAME

Charles E. Barbarow, 147 Greene Ave., Totowa, N.J. 07512

Filed Jan. 28, 1977, Ser. No. 763,497

Int. Cl.[2] A63B *67/02, 3/04*

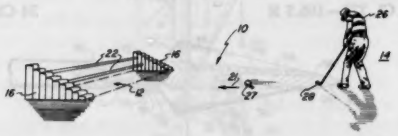
U.S. Cl. 273—176 A **12 Claims**

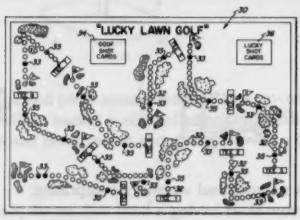
10. In a golf ball game apparatus, the improvement comprising:

a pair of scoring stands for placement upon a playing surface in laterally spaced-apart relationship, each scoring stand including a base; and

a plurality of scoring columns extending along each scoring stand upwardly from the base thereof and located longitudinally along each scoring stand, the scoring columns including corresponding delineated areas on confronting surfaces of the pair of scoring stands for defining a corresponding plurality of scoring zones within a scoring field extending along the playing surface between the scoring columns on the pair of scoring stands;

each scoring stand having a finite lateral width and including a stepped configuration wherein each subsequent consecutive scoring column, as viewed in the longitudinal direction away from the predetermined position on the playing





surface and toward the scoring field, extends upwardly one step further than the next previous scoring column to establish a plurality of consecutive steps of finite width; and

scoring indicia placed on each step for identifying the score corresponding to each scoring column and each delineated area thereof.

4,093,234

GOLF PRACTICE DEVICE

C. Dickinson Barton, c/o Barton Industries, 236 W. 54th St., Kansas City, Mo. 64112

Division of Ser. No. 695,830, Jun. 14, 1976, Pat. No. 4,022,476.

This application Jan. 31, 1977, Ser. No. 764,040

Int. Cl.[2] A63B *69/36, 43/02, 37/12*

U.S. Cl. 273—200 R **3 Claims**

1. In a device for use to practice striking a ball such as a golf ball, the combination of:

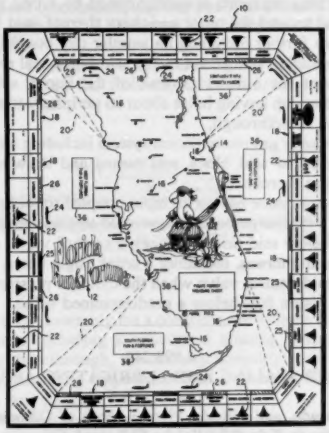
means providing a generally vertical ball suspension member;

a flexible openwork net sized and arranged to completely and tightly surround the ball and presenting a plurality of apertures through which the surface of the ball may be struck, said net having an opening large enough for the ball to pass therethrough;

an endless cord threaded through the apertures of said net in extension substantially around the periphery of said open-

ing, said cord presenting a pair of projecting loops located substantially across said opening from one another, one of said loops being passed through the other loop and secured to said ball suspension member to suspend the ball therefrom in a manner to hold said net opening closed and to maintain said net drawn completely around the ball in a tightly stretched condition.

4,093,235
TOURIST GAME
Dennis P. Barry, Bronx, N.Y., assignor to Publishers Planning Inc., New York, N.Y.
Filed Jul. 29, 1976, Ser. No. 709,633
Int. Cl.[2] A63F 3/04
U.S. Cl. 273—254 **25 Claims**



1. A board game apparatus designed to acquaint players with a predetermined region as represented on a map, said apparatus comprising:

a board having predefined directions thereon corresponding to directions on said map and including a series of marked areas forming a path extending about said board, each of said areas representing a particular locality within said region, having indicia therein identifying said locality, and being disposed on said board to correspond generally with the location of said locality on said map, selected ones of said marked areas on said board being designated as accessible only by indicated modes of transportation;

at least one token means, each token means being dedicated to a different player and being moveable for transportation along said path, said token means comprising a set of tokens wherein each token represents a different mode of transportation for use by the corresponding player, each token being moveable only on marked areas corresponding to localities accessible by the corresponding mode of transportation; and

means for determining the movement of said token means about said path.

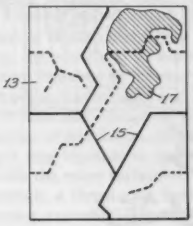
4,093,236
WAR GAME APPARATUS
Randy Lee Hoffa, 8000 E. River Rd., Minneapolis, Minn. 55432
Filed Nov. 22, 1976, Ser. No. 743,976
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—255 **2 Claims**

1. Tactical warfare game apparatus, comprising:

a game board on which various types of terrain and geography are designated, using color to determine elevation and which is marked with an overlying hexagonal grid pattern;

game pieces comprising accurately scaled three dimensional miniatures of instruments of warfare, said pieces visually distinguishable and identifiable;

first charts with tables printed thereon embodying data pertaining to each respective game piece enabling calculation of information relating to the ability of each said piece



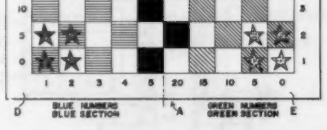
to be moved on said board, its firepower, and its resistance to opponents' fire;

second charts with tables printed thereon embodying data pertaining to said various terrain and geography on said board enabling calculation of the ability of each of said pieces to be moved on said various terrain on said board;

a single die; and

a worksheet having printed thereon a replica of the features on said game board.

4,093,237
CHESS BOARD GAME
Gary Douglas Weiss, P.O. Box 588, Redwood City, Calif. 94062
Filed Sep. 20, 1976, Ser. No. 724,733
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—260 **8 Claims**



1. A modified chess game comprising a board with 100 squares which are evenly divided into four sections of 25 squares, each section having nine alternating light and dark colored squares along its interior borders and 16 interior squares which are alternating dark and light colors, each section having a characteristic color, the nine alternating light and dark colored squares of each section together forming two rows and columns of alternating light and dark colored squares in the middle portion of the board and four standard sets of chessmen, each set being colored to correspond to one of the section colors so that there are four different colored sets.

4,093,238
HORSE RACING GAME

Myron Alan Moskowitz, K 21 Avon Dr., E. Windsor Township, Mercer County, N.J. 08520

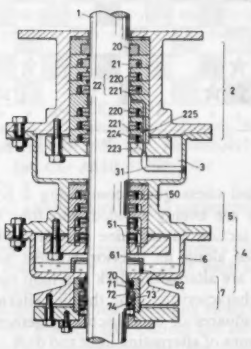
Filed May 7, 1976, Ser. No. 684,195
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—277 10 Claims

1. A game comprising a plurality of selection tiles each selection tile having two faces, one of a group of variables appearing on only one face of said selection tile, a selection tile being provided for each of said variables, a plurality of movement tiles, each of said movement tiles having two faces, each of said faces of said movement tiles having a variable thereon in an arrangement so that the same variable does not appear on both faces of any one of said movement tiles, each movement tile having a number on both faces of said movement tile, any one of a plurality of numbers being applied to said movement tile faces, the sum of such numbers for each group of variables being the same, a playing board comprising crossed lines forming a plurality of ranks and files of spaces, said ranks being provided for and including each said variable, said files underneath said ranks being used to score said game by recording in a particular file the number appearing on the uppermost face of a movement tile upon which also appears the variable of the particular file when said movement tile is played by a person competing in said game.

4,093,239
PISTON ROD SEALING ARRANGEMENT FOR A STIRLING ENGINE

Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,701
Claims priority, application Japan, Jan. 21, 1976, 51-5681; Jan. 21, 1976, 51-5682
Int. Cl.[2] F02G *1/00;* F16J *15/40*
U.S. Cl. 277—3 2 Claims



1. A sealing arrangement for light molecular weight gases employed in a Stirling engine or the like, including a working cylinder, a reciprocating piston disposed in said cylinder, and an axially reciprocable piston rod secured to said piston and extending out of a cylinder opening, comprising:

(a) block seal means surrounding said piston rod immediately below said cylinder opening and including, in order, a bush, a breaker ring, at least one block seal packing ring, and at least one back-up ring, said block seal packing ring comprising a plurality of split ring segments inwardly biased by a coil spring disposed around the outer periphery thereof,

(b) liquid seal means surrounding said piston rod below said block seal means and comprising, in order, a liquid blocking portion including at least one liquid seal packing ring and at least one scraper ring, a liquid reservoir, and a seal means for preventing the escape of the liquid in said reservoir, said liquid seal packing ring comprising a plurality of split ring segments inwardly biased by a coil spring disposed around the outer periphery thereof, said liquid seal means further including an annular cup coaxial with and surrounding said piston rod in said liquid seal reservoir to prevent the outward spread of the liquid, said coaxial annular cup having holes about its periphery to supply the liquid therethrough,

(c) a leakage gas recirculation system including a return line coupled to said block seal means and drawing off gas leaking thereinto,

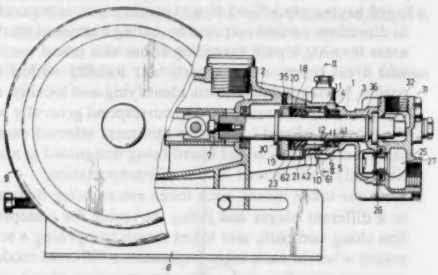
(d) a compressor having an input coupled to said return line and a discharge output connected to said working cylinder below said piston through a control valve, and

(e) opening means, including a crank angle timer, for opening said control valve when the cylinder pressure beneath said piston falls below a predetermined value.

4,093,240
PLUNGER SEALING AND LUBRICATING APPARATUS FOR PUMPS

Taiji Masuda, and Hitoshi Mizuno, both of Odawara, Japan, assignors to Kabushiki Kaisha Shikutani, Odawara, Japan

Filed Jun. 15, 1977, Ser. No. 806,701
Int. Cl.[2] B65D *53/00;* F04B *39/02*
U.S. Cl. 277—15 7 Claims



1. Plunger sealing and lubricating apparatus for horizontal plunger pumps provided with a crank case mounted on a base, a cylinder block fixed to the crank case, a cylinder head secured to the front of the cylinder block, and at least a plunger horizontally slidably disposed in the cylinder block, which comprises a hollow cylindrical room formed coaxially with each plunger in the cylinder block, said room having forward and rearward portions and an annular groove therebetween, a hollow cylindrical retainer having the front portion thereof threadedly fitted in the rearward portion of said room and the back portion projecting backwardly from said room, the front portion of said retainer being in diameter smaller than the back portion and forming an inner annular shoulder therebetween, a first sealing packing mounted in the forward portion of said room in front of said retainer, a second sealing packing

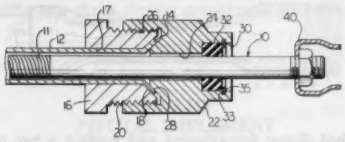
mounted in the back portion of said retainer and having the front side pressed against said shoulder, an oiling packing mounted behind said second sealing packing in the back portion of said retainer and having a leg portion drawn down out of said retainer and immersed in oil in an oil-pan secured to the cylinder block, said retainer having a plurality of holes formed in the front portion for internal communication between a void space defined by said first and second sealing packings and said annular groove in said room, a liquid passage internally provided for communication between said groove in the cylinder block and a suction chamber in the cylinder head, a sealed conduit disposed in said liquid passage and bridging the joining between the cylinder block and the cylinder head.

4,093,241

PUSH-PULL CABLE AND ROD ASSEMBLY WITH SEAL

John Richard Muntjanoff, Aurora, and Ivan Richard Lamport, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1977, Ser. No. 771,505
Int. Cl.[2] F16J *15/32*; F16C *1/10*
U.S. Cl. 277—24 **15 Claims**



1. A seal cap assembly for a control cable system, the control cable system including a cylindrical housing having a cable extending therethrough, the seal cap assembly comprising:

rod means axially disposed in said housing for connection with said cable;

a first member associated with said housing proximate one end thereof, the rod means extending outwardly of the first member;

sealing means disposed about the rod means for sealingly associating the rod means with the cylindrical housing so that the rod means is movable therethrough; and

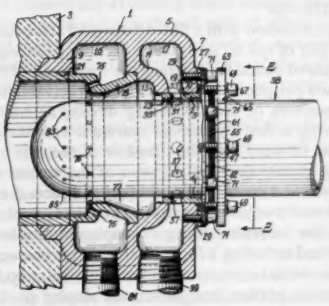
retention means for removably retaining said sealing means disposed about said rod means relative said first member.

4,093,242

SLAG BLOWER WALL BOX SEAL

Stevens M. Terry, Rte. No. 1, Box 500, Evington, Va. 24550

Filed May 31, 1977, Ser. No. 801,613
Int. Cl.[2] F16J *15/56*; F22B *37/52*
U.S. Cl. 277—58 **14 Claims**



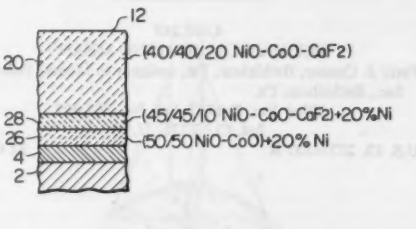
1. A slag blower wall box seal for an opening in a boiler wall adapted to seal around a slag blower or lance tube extending therethrough and into the interior of the boiler, comprising: a wall box having first sealing means contained therein engagable with a rotatable and axially slidable slag blower tube for substantially preventing products of combustion from escaping from the interior of the boiler to the exterior thereof between the slag blower tube and the first sealing means, said wall box including an outer annular flange provided with an opening through which the slag blower tube is to extend, said flange being fixed to the wall box and having a planar outer surface disposed normal to the opening in said first sealing means, in combination with a second seal disposed outside of said wall box and comprising: a diametrically split, floating seal ring having an opening therethrough of substantially the same diameter as the outer diameter of the slag blower tube, said floating seal ring having parallel sides and being mounted on the wall box with its inner side contiguous with and slidable on the planar outer surface of said flange, resilient means securing the parts of the split ring together so that the opening in the ring will engage with the outer surface of a slag blower tube extending therethrough, a thrust ring having a planar inner surface and an opening extending therethrough of a diameter larger than the outer diameter of the slag blower tube but smaller than the outer diameter of the floating split ring, said thrust ring being mounted on the exterior wall of the wall box with its planar inner surface contiguous with and slidably engaged by the outer parallel surface of the floating split seal ring, and with its opening in substantially axial alignment with the opening in said first sealing means, means spacing the inner planar surface of the thrust ring from the opposed outer planar surface of the annular flange, and means fixedly securing said thrust ring to the wall box, said spacing means being slightly greater than the distance between the parallel faces of the floating split seal ring by an amount only sufficient to permit the floating seal ring to move radially between said opposed planar surfaces and at the same time to sealingly engage said planar surfaces and the outer surface of a slag blower tube extending therethrough.

4,093,243

RUBBING CONTACT SEAL MEMBER WITH LOW WEAR COATING AND METAL-CONTAINING UNDERCOAT

Katsuhiro Kishida, and Akira Oyamada, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 10, 1976, Ser. No. 713,265
Claims priority, application Japan, Aug. 29, 1975, 50-103902
Int. Cl.[2] F28D *19/00*; F16J *15/34*
U.S. Cl. 277—96.2 **12 Claims**



1. In a low wear member which is adapted for rubbing contact with another member and is useful as a high temperature rubbing contact seal member on a rotary regenerator of a gas turbine, the low wear member including a metal substrate, at least one undercoat layer formed on a surface of said substrate, and a surface layer coated on an outmost one of said at least one undercoat layer, the material of said surface layer consisting essentially of a major amount of a refractory and wear resistant ingredient selected from the group consisting of CoO, NiO and mixtures thereof and a minor amount of a solid lubricating ingredient, the material of said at least one undercoat layer being said refractory and wear resistant ingredient

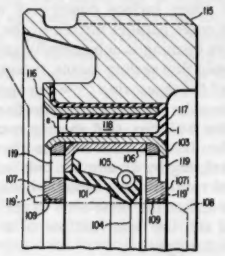
optionally and individually with the addition of a minor amount of said solid lubricating ingredient, said at least one undercoat layer and said surface layer being formed individually by flame spraying, the improvement comprising at least one of said at least one undercoat layers additionally containing a metal, at least one member of which is selected from the group consisting of Cu, Ni or Al, the coefficient of thermal expansion of said metal and the amount of said metal being such that each of the metal-containing undercoat layers is less different from said surface layer in thermal expansion coefficient than an undercoat layer without said metal from said each of the metal-containing undercoat layers.

4,093,244

STUFFING-BOX SEAL PARTICULARLY FOR ROTATING SHAFTS

Jean-Jacques Boutant, 44, rue Charles Drot 92500, Rueil-Malmaison, France, assignor to Regie Nationale Des Usines Renault, Boulogne Billancourt, France

Filed Jan. 7, 1977, Ser. No. 757,733
Claims priority, application France, Jan. 26, 1976, 76 01955
Int. Cl.² F16J *15/18*
U.S. Cl. 277—153 **5 Claims**



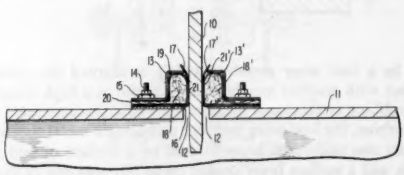
1. A stuffing-box seal particularly adapted for rotating shafts, comprising:
a ring seal;
a retaining sleeve for said ring seal;
an external housing;
a centering sleeve bonded together with said external housing and said retaining sleeve; and
two centering caps located at the opposing axial ends of said ring seal being held by said retaining sleeve wherein one of said centering caps has a set of orifices and grooves for supplying lubricant to a sealing lip of said ring seal.

4,093,245

MECHANICAL SEALING MEANS

Peter J. Connor, Bethlehem, Pa., assignor to Mosser Industries, Inc., Bethlehem, Pa.

Filed Jun. 2, 1977, Ser. No. 802,892
Int. Cl.² F23L *13/06*
U.S. Cl. 277—237 R **32 Claims**



1. Apparatus comprising a moving member, a fixed frame with which the moving member cooperates, and means for sealing between said moving member and said fixed frame, said sealing means comprising means forming a rigid, elongated channel on the frame, said channel having a back wall and at least one side wall; a rope which is resiliently compressible across its width positioned lengthwise in said channel; and an elongated metal strip having opposing front and rear surfaces, said strip being flexibly attached along the first of its two long edges to a side wall of the channel so as to sandwich the rope between the back wall of the channel and the rear surface of the metal strip, said channel means, rope, and metal strip being positioned such that said moving member can press against the front surface of the metal strip in sealing engagement therewith, urging the strip against the rope, the resilience of the rope providing a pressure counter to that exerted by the moving member, said metal strip being thin enough to conform to surface irregularities of the moving member.

4,093,246

UNIVERSAL FEED FINGER DEVICE

Frederick Goff, Box 773, Rte. 4, Travelers Rest, S.C. 29690

Filed Aug. 9, 1977, Ser. No. 823,188
Int. Cl.² B23B *31/00*
U.S. Cl. 279—41 A **5 Claims**

1. A feed finger for gripping and feeding a bar of stock material on an automatic screw machine and the like comprising:
an elongated cylindrical member having a hollow interior and being open at both ends thereof;
one end of said cylindrical member adapted for attachment to a feed tube of said machine through which said bar stock is fed;
a plurality of elongated closed-ended slots extending obliquely to the longitudinal direction of said cylindrical member to define a helical cage; and
said cylindrical member being crimped in a section intermediate the closed ends of said helical slots defining a crimped bore in which said bar stock is gripped.

4,093,247

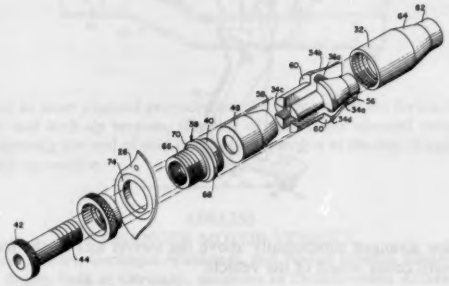
CHUCK

Arthur Alexander Bernard, Beecher, and Richard Allen Bernard, Flossmoor, both of Ill., assignors to Darex Corporation, Beecher, Ill.

Division of Ser. No. 594,349, Jul. 9, 1975, Pat. No. 4,001,975
This application Jul. 20, 1976, Ser. No. 707,026
Int. Cl.² B23B *31/12*
U.S. Cl. 279—53 **5 Claims**

1. In combination with a fluted twist drill sharpening device having a pair of spaced apart chuck receiving bearing surfaces; a plural-jawed chuck for gripping the fluted end of twist drills having two peripheral bearing surfaces receivable in the two bearing surfaces of the sharpening device; an outer tubular body having a first cylindrical rearward end and a second cylindrical forward end, the diameter of the first cylindrical end being greater than the diameter of the second end and a sloping wall section between said first and second cylindrical ends; a plurality of jaw members received in said tubular body, each said jaw member defining a clamping surface for gripping said drill and including a forward arcuate portion corresponding to the second cylindrical end of the tubular body, a rearward arcuate portion, and an arcuate sloping portion corresponding to the sloping portion of the tubular body; each said rearward arcuate portion being stepped to provide a shoulder on each jaw member; and means for applying a jaw closing force to said shoulder portion of each jaw, whereby the arcu-

ate sloping portion on each of said jaw members is caused to co-act with the cylindrical sloping portion of the tubular body; said last named means including a bushing adapted to engage the shoulder on each jaw member, and a manually turnable



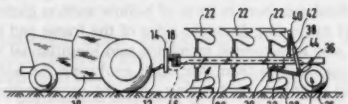
knob having threaded engagement with internal threads on the rearward end of the outer tubular body and adapted to urge said bushing into chuck closing engagement with the shoulder on each jaw.

4,093,248

PIVOTAL IMPLEMENT

Benno Gassner, D-8011 Haus near 14C, and Johann Gassner, D-8011 Haus near 10, both of Goggenhofen, Germany

Filed Mar. 22, 1977, Ser. No. 779,965
Claims priority, application Germany, Mar. 22, 1976, 2612068
Int. Cl.² B60G *17/00*
U.S. Cl. 280—6.1 **11 Claims**



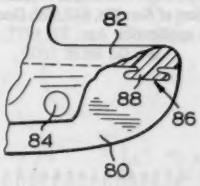
1. A pivotal implement, such as a pivotal plow, comprising:
an implement frame having an axle extending generally longitudinally in the direction of travel about which said frame may pivot;
an undercarriage on which said implement frame is pivotably supported for movement relative to said undercarriage about said longitudinal axle, said undercarriage including at least one pair of spaced-apart wheels and at least one pair of transversely-extending wheel axles, each of which supports one of said wheels and each of which is coupled to said undercarriage for independent movement in a substantially vertical direction, relative to the longitudinal axis of said undercarriage, between an upper limiting position and a lower limiting position;
blocking means associated with said wheel axles for preventing a tipping movement of said undercarriage relative to said implement frame about said longitudinal axle, said blocking means being movable between a blocking position and an unblocking position for respectively preventing and permitting movement of said wheel axles; and
sensor means associated with each of said wheel axles which are responsive to a change in position of its associated wheel axle relative to said longitudinal axle and which are coupled to said blocking means and which move said blocking means into a blocking position when the associated wheel axles moves from said upper limiting position downwardly relative to said longitudinal axle.

4,093,249

SKATE ASSEMBLY

Alan F. Chambers, 3 Gloxinia Crescent, Agincourt, Ontario, Canada

Continuation-in-part of Ser. No. 700,420, Jun. 28, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,054
Int. Cl.² A63C *1/32, 1/42*
U.S. Cl. 280—11.12 **16 Claims**



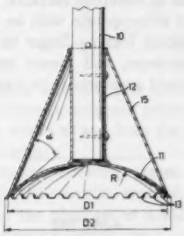
1. An ice skate assembly comprising:
a hardened steel blade having an upper portion and a lower portion including a lower ice engaging surface terminating in upwardly curved front and rear portions, the upper portion including a non-interfering upper surface which is rounded transversely and non-interfering side surfaces;
a blade-supporting body of a synthetic plastic material located about said upper portion such that said lower portion projects outwardly from the body;
anchor structure means defined by the blade and the body and positioned at a discrete location relative to the length of the blade whereby the blade and the body are attached to one another; and
fastener means passing through the body and through the upper portion of the blade at a plurality of locations along the length of the blade spaced from the anchor structure whereby the blade is further attached to the body.

4,093,250

SKI POLE

Nils Wikstrand, Mora, Sweden, assignor to Firma Moon, Malung, Sweden

Filed Oct. 29, 1976, Ser. No. 736,850
Claims priority, application Sweden, Oct. 30, 1975, 7512169
Int. Cl.² A63C *11/24*
U.S. Cl. 280—11.37 Z **16 Claims**



1. In a ski pole having a pole and a snow collecting shoe attached to one end of the pole including cup means defining a recess facing away from the pole, the improvement comprising: means for attaching said cup means at an extreme end of the pole with said recess axially beneath said pole so that said recess is free from any part of said ski pole and said cup means defines a recess formed generally in the shape of a hemisphere having a substantially continuous spherical inner sliding surface, said cup means forming a gliding surface facing snow and

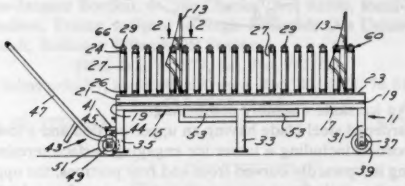
ice compacted therein during skiing and acting as a fulcrum and bearing point for the ski pole.

4,093,251

APPARATUS FOR CARRYING GLASS PANELS

Ambroise O. Boyer, 2345 Randolph, Windsor, Ontario, Canada

Continuation-in-part of Ser. No. 642,905, Dec. 22, 1975, Pat. No. 4,033,597. This application Apr. 27, 1977, Ser. No. 791,441
Int. Cl. B62b *1/08*
U.S. Cl. 280—46 10 Claims



1. An apparatus for carrying, holding and storing automobile glass windshields of the longitudinally curved type so that such windshields may be transported without damage thereto comprising a frame having first and second longitudinal frame members of generally the same length, said frame members being arranged parallel and in laterally spaced apart relation, said frame members having upper surfaces which are flat, with said upper surfaces of said frame members lying in a horizontal plane, a first row of upright dowels fixedly secured to and positioned at predetermined spaced locations along the length of said first longitudinal frame member, a second row of upright dowels fixedly secured to and positioned at corresponding predetermined spaced locations along the length of said second longitudinal frame member, each of said dowels of said first and second rows being provided with an elongated tubular resilient member which is sleeved over the dowel, each of the elongated tubular resilient members being adapted to support a portion of the windshield and prevent the scratching or breaking thereof, an end cap of resilient material for each dowel sleeved over the upper portion thereof, a rotatable locking finger made from a resilient material for each dowel and sleeved over the corresponding end cap, said locking finger having a pair of clamping surfaces, each clamping surface being adapted to cooperate with an opposing clamping surface on an adjacent locking finger to hold and clamp a windshield therebetween, and means associated with said frame for enabling said apparatus to be transported from place to place.

4,093,252

SCOOTER BOARD

John Rego Rue, Marietta, Ga., assignor to Charles A. Burrell, Marietta, Ga., a part interest

Filed Jan. 28, 1977, Ser. No. 763,247
Int. Cl.[2] B62K *9/00*
U.S. Cl. 280—87.04 A 8 Claims

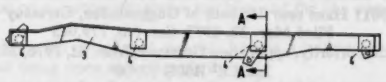
1. A scooter type coaster vehicle comprising a foot board, fore and aft spaced tandem caster wheels on the bottom of the foot board and each freely and independently swiveled for a full 360° of rotation in either direction on a swivel axis substantially normal to the foot board, a forward balancing handle for the vehicle attached fixedly to the foot board and rising thereabove, and said balancing handle having a top hand grip portion arranged substantially above the swivel axis of the forward caster wheel of the vehicle.

4,093,253

CHASSIS FRAME FOR MOTOR VEHICLES

Josef Lehr, Hannover, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Dec. 7, 1976, Ser. No. 748,307
Claims priority, application Germany, Dec. 8, 1975, 2555107
Int. Cl.[2] B62D *21/02*
U.S. Cl. 280—789 9 Claims



1. A chassis frame for motor vehicles comprising parallel longitudinal members in form of hollow section girders; cross members projecting from the sides of the frame and interconnecting said longitudinal members; said longitudinal members having openings in their side walls enclosing the hollow section; said openings conforming with the cross section of the cross members, said cross members having a center section and abutting end sections, said sections being inserted from the sides through the openings into the hollow interior of the longitudianl section; said cross members passing through said longitudinal members, said end sections projecting beyond the longitudinal members, said center section of said cross members penetrating the wall of the longitudinal members facing the vehicle center, said end sections of said cross members passing through the outer wall of the longitudinal members, said center section and said end sections abutting bluntly each other and being connected to each other by welds within the interior of the hollow section of said longitudinal members.

4,093,254

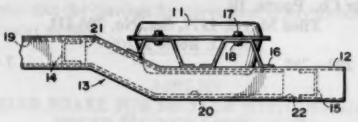
PROTECTIVE FRAME STRUCTURE FOR A MOTOR VEHICLE FUEL TANK

Toshi Ezaki, Toyota, Japan, assignor to Toyoto Jidosha Kogyo K. K., Toyota, Japan

Filed Oct. 22, 1976, Ser. No. 734,978
Claims priority, application Japan, Aug. 6, 1976, 51-105008
Int. Cl.[2] B60R *5/04*
U.S. Cl. 280—783 12 Claims

11. A structure for protecting a fuel tank which is mounted at the rear of the motor vehicle and between two frame members of said motor vehicle which extend along and beyond the sides of said fuel tank, said structure comprising reinforcing members coupled to said frame members, said reinforcing members extending at least the length of said tank whereby said frame members are provided with the reinforcing section adjacent at least the length of said fuel tank and non-reinforc-

ing sections behind said tank and further comprising a kick-up section of said frame members in front of the gas tank, said kick-up section being reinforced by said reinforcing member



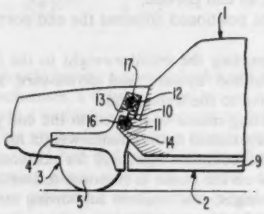
and an inner channel provided on said frame members forward of said kick-up section, the end of said inner channel only adjoining the end of said reinforcing member at the top of said kick-up section.

4,093,255

PASSENGER MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, and Walter Schmid, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 30, 1975, Ser. No. 572,952
Claims priority, application Germany, May 2, 1974, 2421207
Int. Cl.[2] B62D *27/04*
U.S. Cl. 280—788 **39 Claims**



1. A passenger motor vehicle which comprises a lower portion including front and rear axle means operatively connected with each other and an upper portion independent of the lower portion and including at least the passenger space, the upper portion being pivotal with respect to the lower portion about an axis of instantaneous rotation extending generally in the vehicle transverse direction and disposed within the longitudinal center area of the vehicle at least approximately at the height of the center of gravity of the upper portion, characterized in that the upper portion and lower portion are connected with each other within the area of the axle means by way of at least one support means that possesses an elastic yieldingness in at least one direction, further characterized in that the axis of instantaneous rotation is located above the center of gravity of the upper portion.

4,093,256

LOCKING MECHANISM FOR AUTOMOBILE FENDER SKIRT

Luther J. McAdams, Sr., 1626 E. 91st Pl., Chicago, Ill. 60617

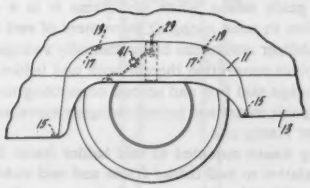
Filed May 11, 1977, Ser. No. 795,727
Int. Cl.[2] B60J *9/00*
U.S. Cl. 280—153 R **3 Claims**

1. A locking device for an automobile fender skirt of the type which is pivotally supported on an automobile fender by hooks located at the lower edges of the front and rear portions of the fender skirt and has a pivotally mounted latch at the top of the fender skirt which latch extends behind the fender to prevent removal of the fender skirt from the fender, said latch being pivoted by operation of an arm integrally formed therewith, said locking device including:

an angle,

a threaded rod engaging a threaded opening in one leg of the angle to thereby enclosed said latch arm between the threaded rod and the legs of the angle when the latch extends behind the fender,

a key operated disc tumbler cylinder lock plug connected to one end of said threaded rod and having radially extending discs projecting from the plug along the length thereof, said key being insertable in the cylinder lock plug to retract said discs,



a cylinder lock housing fastened to and extending through said fender skirt,

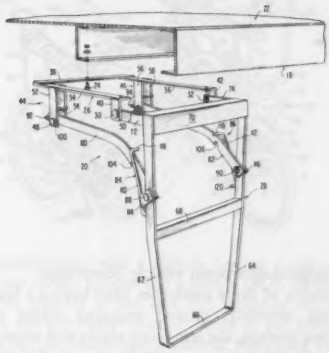
said cylinder lock housing having a passage extending therethrough with said passage including a cylindrical portion adapted to receive said disc tumbler cylinder lock plug and spaced longitudinally extending stops adapted to engage said radially extending discs to prevent rotation of said key operated cylinder lock plug in said passage.

4,093,257

TRUCK LADDER

Larry G. Tarvin, R.R. 2, Havana, Ill. 62624

Filed Jul. 1, 1977, Ser. No. 812,401
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **10 Claims**



1. A ladder assembly securable to a platform of a truck for manual actuation between a collapsed position and an operable position facilitating access to and from the platform, said ladder assembly comprising:

support means including mounting means securable beneath the platform adjacent one side thereof, and guide means securable beneath the platform at a location disposed inwardly of said mounting means, and

a ladder portion comprising:

a ladder frame including a plurality of crosspieces, connectible adjacent one end thereof to said mounting means for swinging movement about a horizontal axis between a generally upright operable position in which said crosspieces are vertically spaced to form climbing steps, and a generally horizontal collapsed position in which said ladder frame is disposed beneath the platform,

stabilizer arm means pivotably connected at one end to said ladder frame and slidably carried by said guide means

during swinging movement of said frame between operable and collapsed positions, said arm means including,

first connecting means disposed remotely of said one end of said arm means for automatically latchingly engaging said guide means when said frame is in an operable position to resist swinging movement of said frame, and

second connecting means located proximate said one end of said arm means for automatically latchingly engaging said guide means when said frame is in a collapsed position to resist swinging movement of said frame,

said stabilizer arm means being manually swingable about the pivot connection thereof with said ladder frame to disengage said first and second connecting means from said guide means and permit swinging movement of said ladder frame, and

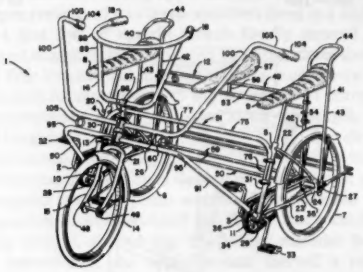
unlatching means mounted to said ladder frame for movement relative to said ladder frame and said stabilizer arm means, said unlatching means being manually movable and including a portion engageable with said stabilizer arm means to pivot said arm means in a manner disengaging said second connecting means from said guide means to allow said ladder frame to be swung to the operable position.

4,093,258

MULTIPASSENGER PEDAL VEHICLE

Eldan L. Ansel, 202 E. Lotus, Ulysses, Kans. 67880

Filed Jan. 13, 1977, Ser. No. 758,844
Int. Cl.[2] B62K *13/04*
U.S. Cl. 280—231 **14 Claims**



1. A multipassenger pedal vehicle comprising:

(a) a plurality of drive assemblies each having a frame with a pedal assembly, ground engaging wheel and seat mounted thereon, the seat being above said wheel and the pedal assembly being operatively connected to said wheel for rotating same;

(b) a steering assembly having a fork with a ground engaging wheel rotatably mounted therein and a stationary sleeve rotatably mounting said fork and handlebars connected to said fork for turning the same in said sleeve;

(c) rigid connecting means extending from the drive assembly frames to said sleeve and having means separably connecting said sleeve to each of said drive assemblies;

(d) vertically spaced first and second rigid transverse connecting means extending between the drive assembly frames and having means separably connecting the same to each of said drive assembly frames;

(e) stationary handlebars separably connected to said sleeve and extending laterally outwardly and rearwardly therefrom; and

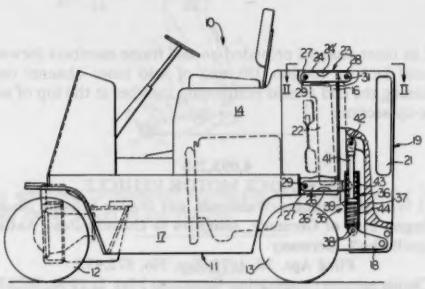
(f) means separably connecting said stationary handlebars to the respective adjacent rigid connecting means that extends from a drive assembly frame to said sleeve.

4,093,259

VEHICLE HAVING RESILIENTLY MOUNTED COUNTERWEIGHT

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 2, 1977, Ser. No. 793,211
Int. Cl. B60R *27/00*
U.S. Cl. 280—755 **7 Claims**



1. A vehicle comprising:

a frame having an end portion;

a counterweight positioned adjacent the end portion of the frame;

means for connecting the counterweight to the frame and permitting limited upward and downward movement thereof relative to the frame; and

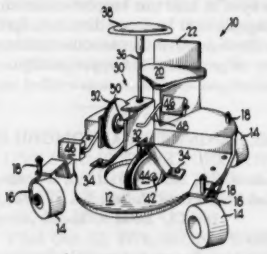
resilient supporting means connected to the end portion of the frame and attached to the counterweight for resiliently supporting the counterweight and for cushioning shock loads exerted on the frame in response to inertia force of the counterweight, said resilient supporting means being independent of said connecting means.

4,093,260

VELOCIPEDE STEERING AND DRIVING ARRANGEMENT

Rouben T. Terzian, Chicago, and Donald K. Fletchic, Arlington Heights, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 30, 1976, Ser. No. 718,907
Int. Cl.[2] B62M *1/02*
U.S. Cl. 280—240 **10 Claims**



1. A vehicle, comprising: a carriage, propelling means movably mounted on the carriage for engaging a support surface to propel said carriage over the support surface, manually operable means on the carriage for driving said propelling means, steering means mounted on said carriage and operatively associated with said propelling means for moving said propelling means to steer the vehicle, said steering means including a generally vertical shaft mounted on the carriage and a horizontal shaft on the lower end of said shaft for mounting said pro-

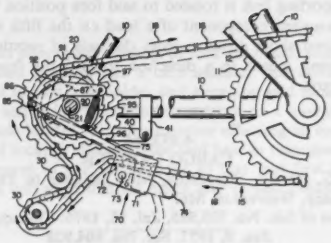
pelling means, linkage means between said operable means and said propelling means permitting steering movement thereof by said steering means relative to said operable means and said carriage and a plurality of universally mounted support wheels for supporting the carriage for movement in any direction over the support surface.

4,093,261

COASTER BRAKE FOR BICYCLE WITH DERAILLEUR SPEED CHANGE MECHANISM

Ray S. Persson, 1220 Minnesota Ave., Bemidji, Minn. 56601

Filed May 9, 1977, Ser. No. 795,104
Int. Cl.² B62M *9/10*
U.S. Cl. 280—241 **8 Claims**



1. In a bicycle having a coaster brake and a derailleur speed change mechanism, a driving chain having a tensioned upper run to rotate a multiple drive sprocket in forward rotation, a wheel having a wheel hub, a drive clutch engagable with said hub to drive said hub in forward rotation from said sprocket, an overrunning chain clutch on a lower run of said chain allowing free movement of said chain in said forward rotation and arranged to seize said chain in reverse rotation when the lower run of the chain is tensioned, means operable by the movement of said chain clutch with the chain when the chain is seized to rotate said sprocket forcefully in a partial reverse rotation, and means actuated by said reverse rotation of said sprocket to disengage said drive clutch and apply said coaster brake.

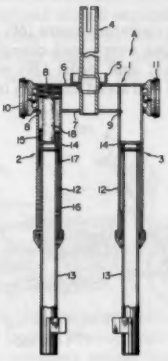
4,093,262

FRONT FORK FOR TWO-WHEELED VEHICLES

Mikihiro Koyama, Kawagoe, and Kazuo Watanabe, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,273
Claims priority, application Japan, Oct. 24, 1975, 50-145154
Int. Cl.² B62K *19/32*
U.S. Cl. 280—279 **4 Claims**

1. An improved front fork for a two-wheeled vehicle such as a motor-cycle comprising: a bridge member (1) having a steering stem 4 fixedly secured at the center part thereof; and a pair of fork members (2, 3) fixedly secured to both ends of the bridge member 1, the improvement comprises: said bridge member (1) being constructed of a hollow square tubular body having the top end parts of said fork members (2, 3) respectively being insertable and fitted into openings (8), (9) perforated at both left and right end parts of bottom wall surface of said bridge member 1, said top end parts of said pair of fork members (2), (3) being fixedly joined to the upper wall 6 and the lower wall (7) of said bridge member (1), respectively and an engagement member (5') being fixedly secured to the lower end part of a head pipe P of a front part F of a vehicle body frame to support said steering stem (4) in a freely rotatable manner, a handle stopper (5) being fixedly secured to said bridge member (1) at a center portion thereof, along said lower end part of said steering stem (4), said handle stopper (5) engaging said engagement member (5') for restricting the relative rotational range of a steering handle H, said handle H being



fixedly secured to the top end of said steering stem (4) with respect to said head pipe P.

4,093,263

SAFETY BICYCLE SEAT REFLECTOR

Peter L. Rihm, 642 N. Cherry St., Celina, Ohio 45822

Filed Jan. 13, 1977, Ser. No. 759,114
Int. Cl.² B62J *1/18*
U.S. Cl. 280—289 R **9 Claims**

1. In combination with a bicycle having a seat which includes a seat cover, springs and a post: a safety bicycle reflector secured directly to the seat and covering the back and springs of the seat, said reflector being in the form and the shape of a bib and comprising a material presenting a reflective surface on all sides and edges and in which the lower portion of the reflector extends forwardly beyond the seat post, said reflector having a securing opening in its forward lower portion for receiving the bicycle post to secure the reflector to the seat post.

4,093,264

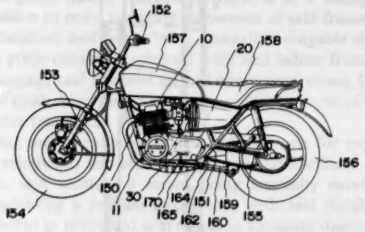
SPEED CHANGING POSITION REGULATING DEVICE FOR AUTOBICYCLES

Takeo Ishihara, Asaka; Hitoshi Yamamoto, Wako, and Tsuyoshi Iiga, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,829
Claims priority, application Japan, Aug. 15, 1975, 50-98470
Int. Cl.² B60K *23/00*
U.S. Cl. 280—296 **7 Claims**

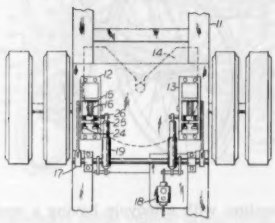
1. A speed changing position regulating device for a motorcycle having a transmission gear, comprising:
a shift pedal (30);

a link mechanism (40, 50, 80, 100);
connecting means (165, 170);
a stand (160) pivotally connected to the frame of said motorcycle;
a speed changing operating means (60) for the transmission gear for changing over speed changing positions by the operation of said shift pedal (30) which is operatively connected with said speed changing operating means (60);



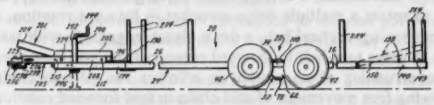
said link mechanism (40, 50, 80, 110) being operated through said connecting means (165, 170) by the rise and fall of said stand (160) so that, when said stand (160) rises, the shift position of said speed changing operating means (60) may be changed over to a neutral position by said link mechanism (40, 50, 80, 110) operated by said connecting means (165, 170) and said speed changing operating means (60) may be held in said neutral position.

4,093,265
FIFTH-WHEEL BRAKING CONTROL
John E. Hodge, Box 91, Moline, Ill. 61265
Filed Jan. 25, 1977, Ser. No. 762,289
Int. Cl.[2] B60T *7/20, 8/18*
U.S. Cl. 280—438 R **2 Claims**



1. In a fifth-wheel assembly of the type having a braking control to prevent a trailer from overriding a tractor to which the trailer is connected, a stop assembly adjustable for different loads to determine the amount of traction to release brakes of the trailer;
said fifth-wheel assembly having a mounting bracket to be attached to a tractor, a fifth wheel, a supporting member for supporting said fifth wheel, and a substantially vertical supporting link, said supporting link having a lower portion to be connected to said bracket and an upper portion to be connected to said supporting member, said braking control being connected to said supporting link, bearing means rotatively connecting the lower portion of said supporting link to said mounting bracket, said supporting member being coupled between the upper portion of said supporting link and said fifth wheel, said supporting link being rotatable about said bearing means to allow movement of said upper portion of said supporting link a short distance between a fore position in a direction toward the front of a tractor and an aft position in a direction toward the rear of the tractor, said mounting bracket having means for stopping the rotative motion of said upper position of said supporting link in a direction toward the rear of the tractor at said aft position where the downward component of a load on the fifth wheel is slightly aft of the axis of rotation of said bearing means,
said stop assembly comprising a fixed member fastened rigidly with respect to said mounting bracket, said fixed member being positioned a short distance in a direction toward the front of the tractor from said upper portion of said supporting link,
stop means positioned between said fixed member and said upper portion of said supporting link,
adjusting means between said fixed member and said stop means, and said adjusting means adjustable to set said stop means in a fore-to-aft direction at a position where said upper portion of said supporting link comes in contact with said stop means and stops said supporting link as said supporting link is rotated to said fore position where the downward component of a load on the fifth wheel is a desired short distance from the axis of rotation of said bearing means in a direction toward the front of said tractor.

4,093,266
CARGO CARRIER
Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.
Division of Ser. No. 705,585, Jul. 15, 1976. This application Jun. 9, 1977, Ser. No. 804,928
Int. Cl. B60d *1/14*
U.S. Cl. 280—491 R **9 Claims**

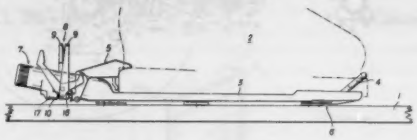


1. A cargo carrier operable between elevated and lowered positions, comprising a bed for supporting cargo, means for supporting the rearward end of said bed and means to raise and lower the front end of said bed relative to the ground, said front end raising and lowering means further comprising a member secured to the front end of said bed and inclined forwardly and upwardly relative thereto, and sliding means adapted to be attached to a towing vehicle and slidingly engaging said inclined member upon fore and aft movement of said sliding means relative to said inclined member, whereby forward movement of said sliding means along said inclined member toward the front end of said inclined member lowers the front end of said bed, and rearward movement of said sliding means along said inclined member toward the rear of said inclined member raises the front end of said bed.

4,093,267
SKI BRAKE
Hans Horn, Wellington, New Zealand, assignor to TMC Corporation, Baar, Zug, Switzerland
Filed Jul. 26, 1976, Ser. No. 708,597
Claims priority, application Austria, Jul. 24, 1975, 5749/75
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **5 Claims**

1. A ski brake for use on a ski, comprising:
a base;
a sole holder movably secured to said base and being movable between a ski boot holding position and a ski boot releasing position;
at least one ski brake arm pivotally secured to said base and being movable between a retracted position and a braking position;
first resilient means for biasing said ski brake arm toward said braking position;

releasable locking means for holding said ski brake arm in said retracted position when said sole holder is in said ski boot holding position and for releasing said ski brake arm to permit movement of said ski brake arm toward said braking position in response to a movement of said sole holder to said ski boot releasing position, said releasable locking means including a movable locking element on said ski brake arm and second resilient means therefor for biasing said locking element into locking relation with said



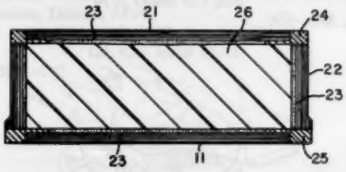
base to effect said holding of said ski brake arm in said retracted position and a cam member operatively connected to said sole holder and engaging said locking element and being movable in response to a movement of said sole holder, said cam member effecting an unlocking of said locking element from said base in response to said movement of said sole holder so that said first resilient means will urge said ski brake arm to said braking position.

4,093,268

PLASTIC DRAG REDUCING SURFACING MATERIAL

Ronald N. Sampson, Murrysville, and Zal N. Sanjana, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1976, Ser. No. 733,593
Int. Cl.[2] A63C *5/04*
U.S. Cl. 280—610 **10 Claims**



1. A ski comprising a core bonded to a base layer, wherein the base layer comprises a rigid plastic matrix and from about 5 wt.% to about 45 wt.% of a thermoplastic, water soluble polymer disposed within the plastic matrix, wherein the base layer provides a surface where the water soluble polymer will be leached out of the rigid plastic matrix upon contact with water, to provide a boundary lubricant film on the layer surface.

4,093,269

SKI BINDING

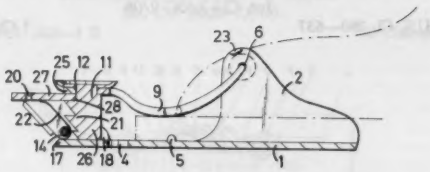
Börje Hoffman, Langshyttan, Sweden, assignor to Hoffmans Verkstads AB, Langshyttan, Sweden

Filed Aug. 27, 1976, Ser. No. 718,171
Claims priority, application Sweden, Sep. 19, 1975, 7510502
Int. Cl.[2] A63C *9/18*
U.S. Cl. 280—615 **3 Claims**

1. An improved ski binding, including a base plate adapted to be fastened to a ski surface having upwardly directed side portions and a forward portion extending beyond said side portions, a boot clamp having a forward portion and two rearward arms having ends rotatably journaled in bearings in said side portions, said improvement comprising:

said boot clamp including first engagement means nonrotatably secured to said forward portion, including a plurality of forwardly extending teeth for removable engagement with second engagement means mounted on said base plate forward portion when said first engagement means is depressed against said second engagement means; and

said second engagement means including pawl means pivotally mounted on said base plate forward portion, pivotal between a first latch position and a second forward unlatched position, and having means biasing said pawl means into said latched position, said pawl means including a forwardly extending release trigger mounted above said pivotal mounting for pivoting said pawl means forward into said second unlatched position, said pawl means including a rearwardly extending latch means for engaging at least one of said first engagement means teeth in said first latched position.

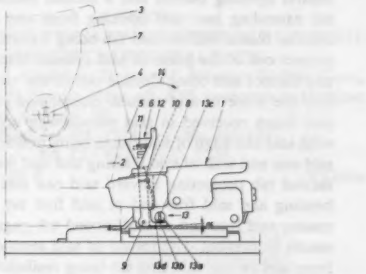


4,093,270

SAFETY SKI BINDING

Erwin Krob, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Zug, Switzerland

Filed Dec. 14, 1976, Ser. No. 750,403
Claims priority, application Austria, Dec. 19, 1975, 9721/75
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—626 **15 Claims**



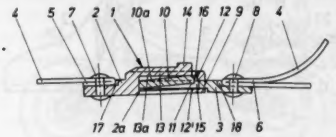
1. In a combination of a ski boot and a ski binding, said ski boot having a lower shell and an ankle cuff pivotally secured to said lower shell to allow pivotal movement of said ankle cuff about a pivot axis in response to shifts in the weight of an individual using said ski boot, said ski binding including at least a heel holder engaging the heel portion of said ski boot to hold said heel portion to a ski, the improvement comprising wherein said ankle cuff has projection means extending rearwardly therefrom and includes first means thereon defining a downwardly facing first surface and wherein said heel holder includes second means defining an upwardly facing second surface, said first surface directly engaging said second surface to limit the amount of pivotal movement of said ankle cuff to the rear of said lower shell, support means for supporting said second means for movement toward and away from said heel portion of said ski boot and resilient means for resiliently urging said second means toward said ski boot.

4,093,271

BUCKLE FOR SAFETY STRAP FOR SKIS

Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Zug, Switzerland

Filed Nov. 24, 1976, Ser. No. 744,938
Claims priority, application Austria, Nov. 26, 1975, 8990/75; Feb. 25, 1976, 1411/76
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—637 7 Claims



1. A buckle for use with a safety strap to effect a securement of a skier to a ski, comprising:

a first buckle part having means defining a housing thereon, said housing having spaced side walls and spaced end walls, the spacing between said walls defining a cavity therebetween, means defining a passageway in one of said end walls extending from the exterior of said housing into said cavity, stationary lip means adjacent one side of said passageway and facing inwardly of said cavity, at least one of said side walls adjacent said lip means being defined by a first resiliently flexible tab formed on said housing and anchored thereon adjacent said end wall remote from said end wall having said passageway therein, said first tab being pivotal about the anchor point from a normal position spaced from said lip means into said cavity so that the free end thereof is movable into said cavity past said lip means, the resiliency of said first tab effecting a return thereof to said normal position; and

a second buckle part having a flat annular frame with a central opening therein and a second resiliently flexible tab extending into said opening from one edge of said annular frame, said second tab being formed to normally project out of the plane of said annular frame at the free end thereof and being flexible out of the normal position into the plane of said annular frame, said second buckle part being received in said passageway and said cavity with said one edge of said frame being positioned adjacent said one end wall of said housing and said free end of said second tab projecting toward said one side wall of said housing and said free end of said first tab past said lip means, said free end of said second tab engaging said lip means to prevent withdrawal of said second buckle part from said cavity, said first tab being resiliently flexed into said cavity and into engagement with said second tab to effect a movement of said second tab out of said normal position into said plane of said annular frame to position said second tab in alignment with said passageway and out of alignment with said lip means for removal of said second buckle part from said first buckle part.

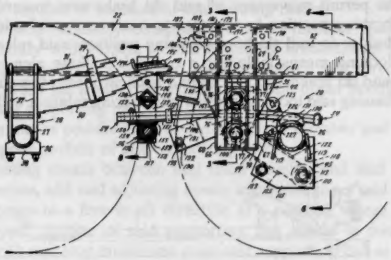
4,093,272

UNITARY LIFT AND SPRING VEHICULAR SUSPENSION

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Oct. 15, 1976, Ser. No. 732,874
Int. Cl.[2] B60G 11/10
U.S. Cl. 280—686 12 Claims

10. In an axle suspension: bracket means attachable to a frame of a vehicle; a torque beam pivoted to the bracket means with an end extending therefrom, means for attaching said torque beam to an axle; a lift beam pivotally connected to the bracket means beside the torque beam; and means to connect the lift beam to the axle alongside the means for attaching the



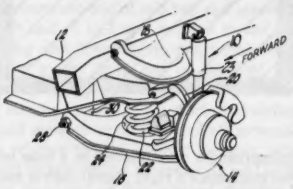
torque beam to the axle; the lift beam being pivotable in a plane parallel to the pivoting of the torque beam.

4,093,273

INDEPENDENT SUSPENSION SYSTEM

John D. Fitzpatrick, Utica, and Gary L. Smith, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 745,215
Int. Cl.[2] B60G 3/14
U.S. Cl. 280—696 4 Claims



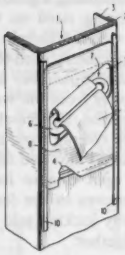
1. In combination with a vehicle frame, an independently sprung front wheel assembly including a wishbone-shaped control arm having an outer end and a pair of spaced apart inner ends; a steering knuckle and associated road wheel mounted on the outer end of said control arm; a vertically oriented coil spring disposed between said control arm and said frame; a horizontally oriented shaft; means connecting said spaced apart inner ends of said control arm for pivotal movement about said shaft; mounting means having a bore formed therethrough a predetermined diameter larger than the diameter of said shaft and surrounding said shaft intermediate said inner ends of said control arm; fastener means for rigidly securing said mounting means to said frame; and elastomeric bushings mounted on said shaft and confined in the bore of said mounting means, said elastomeric bushings having at least one side of reduced effective thickness forming a space providing a low horizontal rate and a high vertical rate for increased horizontal movement and minimal vertical movement of said wheel and said control arm relative to said frame during road impact conditions, thereby substantially isolating said frame from such impacts.

4,093,274

UPPER FITTING OF A SHOULDER STRAP ARRANGED DISPLACEABLE IN HEIGHT WITHIN A BODY HOLLOW SPACE

Hansjürgen Scholz, Echterdingen; Jürgen Gimbel, Gechingen, and Walter Jahn, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 11, 1976, Ser. No. 740,940
Claims priority, application Germany, Nov. 15, 1975, 2551329
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—747 10 Claims



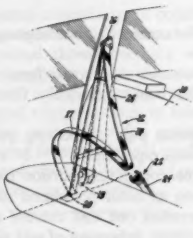
1. An upper fitting of a shoulder belt band arranged adjustable in height within a body hollow space means provided with an outlet opening for the belt band, characterized in that the outlet opening is covered off by a shield means which in turn is provided with an aperture for the belt band, and in that the position of the aperture is adapted to be matched to the adjusted height of the fitting.

4,093,275

SEAT BELT SECURING DEVICE

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1977, Ser. No. 776,626
Int. Cl.[2] A62B *35/00*
U.S. Cl. 280—747 8 Claims



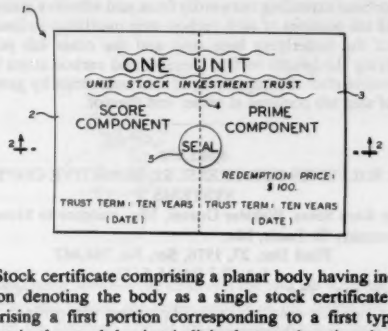
1. An occupant restraint system for a motor vehicle body having an occupant seat and comprising: a belt, means anchoring one end of the belt outboard the seat and adjacent the lap of the occupant and the other end of the belt outboard the seat and adjacent the shoulder of the occupant, one of the belt anchoring means being a retractor for winding up the belt to a vertically extending stored position outboard the seat to permit ease of occupant ingress and egress, a belt securing device connected to the vehicle body inboard the occupant, said securing device having a pair of tong arms pivotally mounted for movement to a closed position for capturing encirclement of the belt, spring means biasing the tong arms to an open spaced-apart belt-releasing position, an actuating member positioned between the tong arms and operably connected therewith for pivoting the tong arms against the bias of the spring to a closed position for capturing encirclement of the belt upon forced movement of the actuating member during one-handed entry of the belt between the tong arms, and releasible latch means operative on the tong arms for maintaining the tong arms in the closed position of belt capturing encirclement.

4,093,276

BIPARTITE STOCK CERTIFICATE

A. Joseph Debe, 214 Stewart Ave., Garden City, N.Y. 11530

Filed Apr. 20, 1977, Ser. No. 789,166
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—1 R 10 Claims



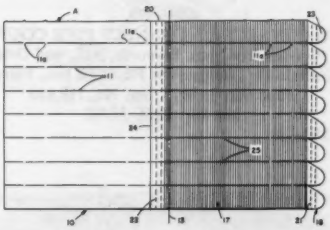
1. Stock certificate comprising a planar body having indicia thereon denoting the body as a single stock certificate and comprising a first portion corresponding to a first type of interest in the stock having indicia thereon denoting the first type of interest and a second portion corresponding to a second type of interest in the stock having indicia thereon denoting the second type of interest and means for effecting bipartition of the body into separated first portion to signify on its face that the holder has only the first interest in the stock, the separated second portion to signify on its face that the holder has only the second interest in the stock and the unseparated body to signify on its face that the holder has both the first and second interests in the stock.

4,093,277

ASSEMBLY FOR PREPARING INSERTS FOR HOSPITAL IDENTIFICATION BRACELETS

John L. Nolan, Glenview; Harvey M. Nordby, Buffalo Grove, and Marvin E. Jensen, Niles, all of Ill., assignors to Hollister Incorporated, Chicago, Ill.

Filed Jan. 21, 1977, Ser. No. 761,423
Int. Cl.[2] B41L *1/22, 1/26*
U.S. Cl. 282—24 R 1 Claim



1. An assembly for preparing imprinted inserts for hospital identification bracelets, including a base sheet of imprintable card stock, said sheet being divided by rows of parallel perforations into a plurality of severable elongated strips, said strips being divided by a transverse line of perforations across the central portion thereof into an identification section and a severable handle section, said identification sections having an outer insertion end portion of tapering shape, wherein the improvement comprises: a sheet of carbon paper arranged to overlay said identification sections with the carboncoated side

thereagainst, said carbon sheet being divided into a plurality of severable elongated strips having severance lines in alignment with those of said base sheet so that the base sheet strips can be removed one at a time with the respective overlying carbon strip, said carbon sheet strips each having a first uncoated margin extending over the insertion end portion of the underlying base strip and a second uncoated margin on the opposite side thereof adjacent the line of division between said identification and handle sections, said first and second margins of each carbon strip being adhesively attached to said base sheet in defined areas spaced inwardly from the outer edge of their respective margin, both of said margins providing unattached tab portions extending outwardly from said adhesive areas, one of said tab portions of each carbon strip overlying an insertion end of the underlying base strip and the other tab portion overlying the handle section thereof, said carbon strips being removable after the imprinting of said base strips by grasping one of said tab portions at either end thereof.

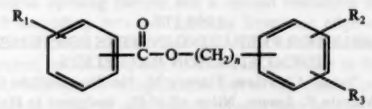
4,093,278

DYE SOLVENTS FOR PRESSURE-SENSITIVE COPYING SYSTEMS

James Kern Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 754,467
Int. Cl.[2] B41M *5/22*
U.S. Cl. 282—27.5 **13 Claims**

1. A pressure-sensitive recording system comprising
(a) supporting sheet material,
(b) mark forming components arranged in contiguous juxtaposition and supported by said sheet material, said components comprising a chromogenic material held within microcapsules and an electron accepting material of the Lewis acid type reactive with said chromogenic material to produce a mark when brought into reactive contact, and
(c) a pressure releasable solvent for said chromogenic mark forming component, said solvent comprising an aryl ester represented by the structure



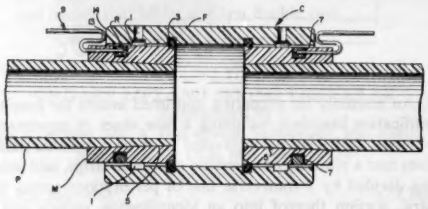
wherein R_1 is hydrogen, methyl or ethyl; R_2 is hydrogen or C_1 to C_9 alkyl; R_3 is hydrogen, methyl or ethyl; and n is zero or 1.

4,093,279

QUICK CONNECT-DISCONNECT PIPE COUPLING

Anthony Fredrick Verdesca, Haworth, N.J., and Orlando Borrajo, Hialeah, Fla., assignors to Fib-R-Fit Inc., Fairview, N.J.

Filed Sep. 2, 1976, Ser. No. 719,826
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—23 **1 Claim**



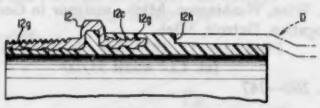
1. A coupling for joining the ends of a tubular pipeline through which a fluid is to flow comprising a tubular male adaptor member having an inside tapered surface suitable for receiving and being bonded to an appropriately tapered end of the pipeline; a split ring having side walls normal to the longitudinal axis of the coupling provided in a groove in the outside surface of said male adaptor member and containing a hole in each side of the split in the ring, the axis of said holes being parallel to the direction of fluid flow; a restraining pin fitted through the wall of the male adaptor member and seated in the holes of the split ring to retain said split ring in the contracted position in the groove of said male adaptor member without protrusion beyond the outside diameter surface of said male adaptor member; a female member for receiving the male adaptor member and containing a groove on the inside surface thereof, said groove being sized so that the walls thereof snugly engage the side walls of the split ring when the restraining pins which have a geometry such that in one position they will not engage the female member and when the pins are rotated in their seats away from the wall of the male adaptor member to another position, the female member will engage and automatically drive the pin from its seat when said male adaptor member is inserted into said female member allowing for expansion of said split ring to its natural uncontracted position within the grooves in the female section and male adaptor member thereby locking said male adaptor member and female member together.

4,093,280

SYNTHETIC RESINOUS PIPE JOINT MADE UP IN ONE-PIECE WITH A METALLIC MALE SCREW

Tadao Yoshizawa, and Saburo Kadowaki, both of Sakai, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jun. 14, 1976, Ser. No. 695,564
Claims priority, application Japan, Jun. 14, 1975, 50-80872
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—39 **16 Claims**



1. A pipe joint for connecting heterogeneous pipes comprising:
a metallic pipe connecting portion forming one end of said pipe joint and being externally threaded at one end thereof;
a synthetic resinous pipe connecting portion forming the other end of said pipe joint;
said metallic pipe connecting portion having a nut-shaped part formed on its outer peripheral surface between the externally threaded one end thereof and the other end thereof to facilitate tightening of said pipe joint, the inside face of metallic material constituting said nut-shaped tightener part exhibiting an out-of-round excavated form;
the other end of said metallic pipe connecting portion extending from said nut-shaped tightener part in the opposite direction of said externally threaded one end thereof being substantially tubular in configuration, and the external and internal peripheral surfaces of said substantially tubular configured other end of said metallic pipe connecting portion being provided with a ring-shaped part irregularly configured along the length thereof so as to provide, alternatingly, increasing and decreasing radial dimension thereof along any given line drawn longitudinally along the peripheral surface of said tubular other end;
said resinous pipe connecting portion including an integral inner layer completely covering the entire inner surface of said metallic pipe connecting portion extending from said resinous pipe connecting portion in the direction of said

metallic pipe connecting portion, and including the inner surfaces of said externally threaded end, the excavated part of said nut-shaped part and the tubular other end of said metallic pipe connecting portion;

said resinous pipe connecting portion further embedding said tubular other end of said metallic pipe connecting portion, including the irregularly configured external peripheral surface thereof; and

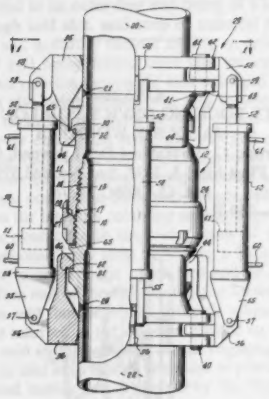
said inner layer of said resinous pipe connecting portion having an inner surface form of substantial roundness throughout the length thereof and of the inner surface of said metallic pipe connecting portion which it covers.

4,093,281

METHOD AND APPARATUS FOR AXIALLY LOADING THREADED CONNECTORS

Martin B. Jansen, Jr., Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Nov. 15, 1976, Ser. No. 742,072
Int. Cl.² F16L *55/00*
U.S. Cl. 285—39 **26 Claims**



1. A pipe connector comprising, in combination; a tubular pin member having an external thread and a tubular box member having an internal thread meshing with said external thread, means for applying axially directed tensil forces in opposite directions to said pin member and box member, respectively, to preload engaging faces of said meshing threads against one another, and means for retaining said preload between said engaging faces while said axially directed tensile forces are applied and after application of said axially directed tensile forces has been discontinued.

4,093,282

HOSE CLAMP

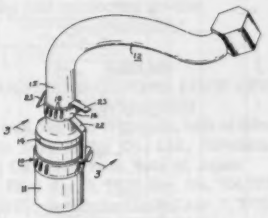
George H. Kyriakodis, 1944 King Arthur Rd., Philadelphia, Pa. 19116

Filed Nov. 24, 1976, Ser. No. 744,502
Int. Cl.² F16L *35/00*
U.S. Cl. 285—114 **2 Claims**

1. A hose clamp adapter strap for use in conjunction with a pair of constricting band hose clamps wherein a first such clamp is clampingly disposable about a resilient hose to clamp such a hose about a rigid fitting, and wherein a second such clamp is clampingly disposable about another portion of the aforesaid rigid fitting, said adapter strap comprising in combination,

(a) an elongated strap made of semi-rigid deformable material having first and second strap ends, said strap being rigidly lockable at said first end to said first clamp, and being adjustably rigidly securable at said second end to said second clamp and being effective when so secured to prevent said clamps from moving away from one another, the adjustable rigid securement of said strap second end to said second clamp being effected by passing said strap second end between the constricting band hose clamp and the underlying surface of said rigid fitting and then reversely turning said strap second end outward away from the fitting and backward over the constricting band clamp and an intermediate portion of said strap,

(b) a tab extending toward said first strap end from an intermediate point along the length of the strap, the rigid lock of said strap to said first clamp being effected by capturing



the clamp between the strap and the said tab with the strap disposed against the inside surface of the clamp and with the tab disposed against the outside surface of the clamp, and then turning the said first strap end outward around the clamp and reversely to overlie the outer surface of the clamp and align with the said tab, and

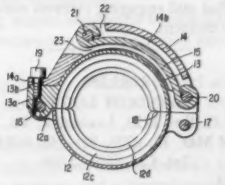
(c) hose surface deforming protuberances carried by said elongated strap in hose surface engaging position and effective to deform such hose surface radially inwardly in limited surface areas when said first clamp is clamped about the hose to thereby effectively lock the hose to said first clamp.

4,093,283

DEVICE FOR RELEASABLY FASTENING TUBE OR PIPE ENDS

Karl Weinhold, Um Jagdfeld 43, 4040 Neuss, Germany

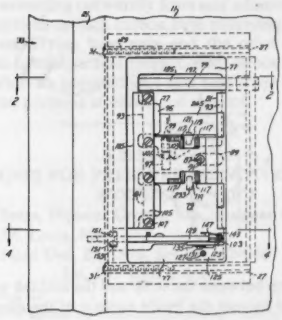
Filed Nov. 22, 1976, Ser. No. 744,090
Claims priority, application Germany, Nov. 27, 1975, 2553189
Int. Cl.² F16L *33/12*
U.S. Cl. 285—243 **14 Claims**



1. A device for releasably fastening tube or pipe ends comprising a plurality of shell parts pivotally connected together and forming an annular shell in a closed position of the device, radially inwardly directed flanges on said shell parts for retaining the tube or pipe ends within said annular shell, a toggle lever lock connecting two adjacent shell parts having ends in engagement in said closed position of the device, a toggle lever for said toggle lever lock pivotally connected to an engaged end of one of said two shell parts and extending along the other of said two shell parts in the closed position of the device and a spring for said toggle lever lock lying, in said closed position of the device, between said toggle lever and said other of said two shell parts, engaging said engaged end of said other of said

two shell parts and said toggle lever and loaded in said closed position of the device.

4,093,284
DOOR CONSTRUCTION
Leon Yulkowski, 2005 Pontiac Rd. E., Pontiac, Mich. 48057
Continuation-in-part of Ser. No. 530,958, Dec. 9, 1974. This application Jul. 19, 1976, Ser. No. 706,494
Int. Cl.[2] E05C 3/26
U.S. Cl. 292—216 **44 Claims**



1. In a door hinged to a door frame and a locking mechanism on the closing upright edge of the door, the improvement comprising:

said locking mechanism including a longitudinal engaging element on and carried by said closing edge and being movably mounted;

a corresponding longitudinal counter element connected to one upright edge of the door frame and being laterally opposed to and generally parallel and interlocked with the engaging element;

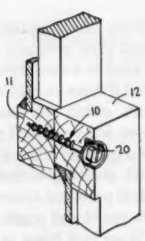
said engaging element and counter element extending over at least a substantial part of the door height;

said engaging element being sufficiently movable that it disengages the counter element so that the door may open relative to the frame;

a blocking means movably mounted on the door and in one position retaining the engaging element in a locked position when the door is closed;

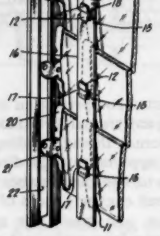
and a grip means movably mounted on the door and connected to said blocking means for moving it to a "release" position so that said engaging element moves to disengage said counter element.

4,093,285
WINDOW LOCK
Paul R. Fayle, P.O. Box 1121, Lexington, Va. 24450
Filed Mar. 18, 1976, Ser. No. 668,002
Int. Cl.[2] E05C 5/04
U.S. Cl. 292—251 **1 Claim**



1. A screw lock assembly for windows, wherein the windows include abutting frame members in the closed position, comprising drilled aligned apertures at at least one position along said frames, said aligned apertures being open only at one end adjacent the inside of said windows and closed toward the outside, a screw for insertion into said apertures from the inside directly engaging said apertures to lock said windows together and draw said frame members together into face-to-face contact, a head and integral flat washer on said screw, a cup washer positioned adjacent the open end of the apertures, said apertures at the open end having a substantially enlarged portion, said cup washer being positioned in said enlarged portion with a tight frictional fit to prevent turning of the same, the head of said screw being recessed into said cup washer to limit accessibility to the head, and locking means formed over substantially the full interface between said washers to prevent unauthorized removal of said screw, said locking means comprising a plurality of curved ridges formed on the underside of said integral flat washer, said ridges frictionally engaging the adjacent face of said cup washer and binding against said washer prevented from rotating by the frictional fit in said enlarged portion.

4,093,286
SECURITY LOCKING DEVICE FOR LOUVRE AND JALOUSIE WINDOWS
Larry D. Burton, 12232 Waldorf Dr., Lynwood, Calif. 90262
Filed Mar. 3, 1976, Ser. No. 663,575
Int. Cl.[2] E05C 19/18
U.S. Cl. 292—259 R **2 Claims**



1. A security system for louvre and jalousie windows and/or doors having a multiplicity of glass slats or panes, said system comprised of:

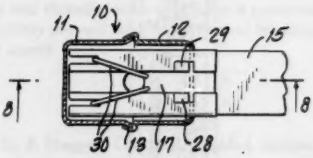
a multiplicity of thin metallic bracs, that are formed in the shape of a rectangle having long and short sides whereby one of the long sides is uninterrupted while the other long side is interrupted intermediate said short sides to form two flanges having first and second portions, said first portions extending outward from said interrupted side to join with said second portions, said second portions extending substantially perpendicular to said first portions, each of said brac wrapping around each of said glass slats or panes; and

a latching means comprised of an elongated rigid flat member having a multiplicity of openings on one side in a predetermined space relationship based on the location of said brac flanges on said panes, whereby said openings of said latching means mates with said first portions of said bracs thereby forming a stationary integrated brac-latch system which precludes the removal of said glass panes or slats from said louvre window or door.

4,093,287
CAR SEAL

George G. Canter, 2 Overlook Ave., Great Neck, Long Island, N.Y. 11021

Filed Feb. 22, 1977, Ser. No. 770,915
Int. Cl.[2] B65D 33/34
U.S. Cl. 292—317 4 Claims

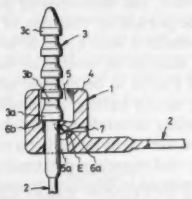


1. A car seal and the like comprising a two-piece cap and a sealing strip for overlapping a car door handle and the like, said two-piece cap disposed at substantially right angles to the plane of the strip, one of said sections having a slot therein, said strip of material at its outer free end being of a size and shape to pass through said slot, said strip of material at its opposite forward end and inwardly thereof having an enlarged section, said forward end being folded over said enlarged section in slightly spaced relation therewith, said enlarged section along its side edges also being folded over said forward end to provide flanges retaining the same in such folded-over position, said folded-over end of the strip, the enlarged portion of the strip, and said flanges having coinciding slots extending inwardly of their forward ends, spring-actuated locking means disposed in said coinciding slots, said flanges defining therebetween an area for laterally retaining said spring-actuated locking means in contact with the outer faces of the strip, said bent-over portions of the strip providing a longitudinal space therebetween to receive the outer free end of the strip, and holes in the free end of the strip and in the forward end of the strip between said flanges which coincide when said free end of the strip is inserted in the slot and pushed to the innermost end thereof, said spring-actuated means engaging in said coinciding holes in said strip to lock the same in position when said spring-actuated means are displaced by the free end of said strip.

4,093,288
BINDING STRAP MADE OF SYNTHETIC RESIN

Tadashi Suzuki, Saitama, Japan, assignor to Toska Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1976, Ser. No. 755,171
Claims priority, application Japan, Jan. 14, 1976, 51-3049
Int. Cl.[2] B65D 55/06
U.S. Cl. 292—321 8 Claims

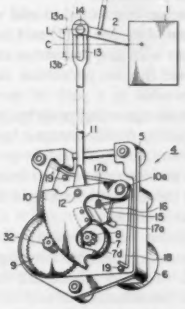


1. A binding strap comprising:
a head portion, said head portion including a centrally located passageway;
an intermediate portion having a first end extending from a side of said head portion;
a connecting portion formed at a second end of said intermediate portion remote from said first end;
stop tooth means formed within said passageway, said stop tooth means comprising a centrally projecting fixed tooth part having an upper face and a centrally projecting elastically rockable tooth part having upper and lower faces positioned diametrically opposite to said fixed tooth part;
a slit, said slit being positioned below said rockable tooth part for further assisting rocking motion of said rockable tooth part, said slit forming a supporting wall face which supports said lower face of said rockable tooth part when said rockable tooth part is in a first position for lockably restraining said connecting portion, while allowing free rocking motion when said lockable tooth part is in another position during insertion of said connecting portion, both said upper faces lying in the same plane only when said fixed tooth part and said rockable tooth part are lockably restraining said connecting portion.

4,093,289
ELECTRIC/MANUAL DOOR LOCK OPERATING MECHANISM

Akira Inabayashi, and Jun Watanabe, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima and Tanaka Instrument Co., Ltd., Yono, both of, Japan

Filed Apr. 5, 1977, Ser. No. 784,757
Claims priority, application Japan, Apr. 7, 1976, 51-43683[U]
Int. Cl.[2] E05C 13/04
U.S. Cl. 292—336.3 13 Claims



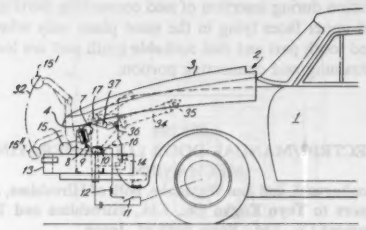
1. A vehicle door lock operating mechanism, comprising:
(a) a door lock mechanism,
(b) actuating means connected to said lock mechanism and movable between a locked position and an unlocked position,
(c) operating means connected to said actuating means for manually moving same between said locked and unlocked positions,
(d) a reversible electric motor,
(e) a pivotal member movable between a locking position, an unlocking position, and a neutral position,
(f) reduction gear means engageable between said electric motor and said pivotal member for implementing the movement of the latter from its neutral position to either its locking position or its unlocking position by the selective energization of said electric motor,
(g) means connecting said actuating means and said pivotal member and including means for permitting a limited degree of free movement of said actuating means independent from said pivotal member when the latter is in its neutral position, whereby the lock mechanism may be manually operated independently of said motor and reduction gear means, and
(h) spring means for biasing said pivotal member towards its neutral position.

4,093,290

VEHICLE WITH SAFETY DEVICE

Leonard Charles Pearson, Wokingham, England, assignor to National Research Development Corporation, London, England

Filed Mar. 9, 1976, Ser. No. 665,229
Claims priority, application United Kingdom, Mar. 14, 1975, 10752/75
Int. Cl.[2] B60R 21/14
U.S. Cl. 293—15 7 Claims



1. A vehicle including:
an impact member located at low height off the ground, and by which the moving vehicle will tend upon collision with a typical pedestrian to make impact below his center of gravity;
a bonnet onto which said impact by said impact member will tend to throw said pedestrian;
at least one sensor means connected to said vehicle for sensing and being actuated by one of (1) said initial collision of said impact member with said pedestrian and (2) the subsequent impact of said thrown pedestrian on said bonnet;
a safety device moveable in a path of movement from a stowed position to an operating position, in which operating position said safety device forms a barrier to restrain said pedestrian from falling off said bonnet;
said safety device in said stowed position lying at a height off the ground below that of said bonnet and closely similar to that of said impact member;
said path of movement of said safety device from said stowed to said operating position carrying it first horizontally and outward from said vehicle and then upward; and
means responsive to the actuation of said at least one sensor means for moving said safety device through said path of movement thereof from said stowed to said operating position.

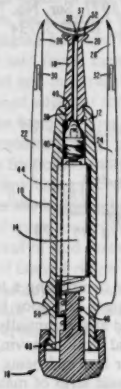
4,093,291

CONTACT LENS APPLICATION AND REMOVAL INSTRUMENT

Herbert L. Schurgin, 26 Juniper St., Wenham, Mass. 01984

Filed Aug. 17, 1977, Ser. No. 825,184
Int. Cl.[2] A61F 9/00
U.S. Cl. 294—1 CA 11 Claims

1. An instrument for application onto and removal of a contact lens from a user's eye comprising:
a body adapted to be hand-held by a contact lens user and having a chamber containing an illumination source;
first and second arms supported by said body and outwardly extending therefrom in spaced relationship to each other, said arms having end portions of a material and configuration for safe engagement with a user's eye;
said arms being manually movable toward and away from each other;
a footplate supported by and outwardly extending from said body between said first and second arms and having a curved outer surface for supporting a contact lens thereon, and an aperture centrally disposed in said curved surface through which light is emitted from said illumination source to provide a visual alignment target by which the instrument can be aligned with a user's eye; and
said first and second arms having end portions extending by



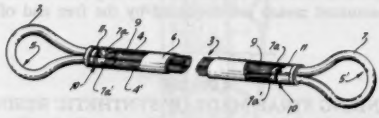
a predetermined amount beyond said footplate, the tips of said end portions being configured to facilitate grasping of the confronting peripheral edges of a contact lens on a user's eye.

4,093,292

SLING AND ITS METHOD OF MANUFACTURE

Jose Maria Maso Marcet, calle Navas de Tolosa 353, and Jose de Calasanz Peradejordi Guanabens, calle Enrique Granados 101, both of Barcelona, Spain

Continuation-in-part of Ser. No. 560,990, Mar. 21, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,106
Claims priority, application Spain, Apr. 1, 1974, 201899; Nov. 13, 1976, 224442
Int. Cl.[2] B66C 1/18
U.S. Cl. 294—74 7 Claims



1. A sling for moving loads, comprising a coil having a multitude of substantially uniform, closed and juxtaposed loops, said loops being elongated to form a middle portion of two substantially parallel adjacent coil sections, each coil section having filamentary material strands which are located adjacent to each other, and bight-shaped portions at opposite ends of said middle portion so that one of said bight-shaped portions may be connected with a load to be moved; means for retaining said coil sections in substantial parallelism adjacent each other when a load is to be moved, said retaining means including winding means having a plurality of substantially annular turns extending circumferentially about strands in each of said coil sections, said turns including a run located in interspaces bounded by said strands and extending from one to the other of said coil sections in direction transversely of the elongation of said loops for interconnecting said coil sections and for preventing them from moving apart from each other when said one bight-shaped portion is urged in direction away from the other of said bight-shaped portions during movement of the load, said retaining means including a substantially tubular flexible sheath surrounding said coil sections and having a length which extends over a substantial portion of the length of the coil; means for protecting said bight-shaped portions and including a pair of flexible protective sleeves each surrounding a respective one of said bight-shaped portions; and means for

preventing relative movement between said protective sleeves and said sheath, and including means for fastening said sleeves to opposite ends of said sheath, said fastening means including a threaded seam of stitches interconnecting said sleeves and said sheath, said threaded seam of stitches being located exteriorly of said winding means so that relative movement of said coil sections apart from each other during movement of the load is counter-acted substantially by said winding means, whereby said threaded seam of stitches is protected from damage to thereby prevent relative movement between said sleeves and said sheeth.

4,093,293

SHACKLES

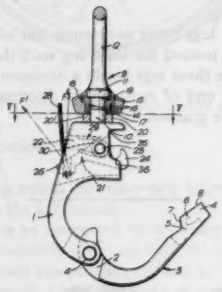
Richard D. J. Huggett, Clanfield, England, assignor to Lewmar Marine Limited, Havant, England

Filed Sep. 21, 1976, Ser. No. 725,271

Claims priority, application United Kingdom, Oct. 6, 1975, 40865/75

Int. Cl.² F16G *15/08*

U.S. Cl. 294—83 R **1 Claim**



1. In a marine shackle having a body comprising a closable and openable loop and a retaining means rotatably secured to the body the improvement comprising a post formed integrally in one piece with the body and having a cylindrical stem portion and a head portion of a diameter larger than that of the stem portion, the post penetrating an aperture in the retaining means, a split collar on the post in said aperture comprising two identical discrete parts held against lateral separation by the sides of said aperture and having at least a portion between the head portion and the retaining means effective to prevent movement of the retaining means away from the body over the head of the post, and spacer means surrounding the post and abuttable against both the body and the retaining means to maintain a fixed minimum spacing between said body and retaining means, the spacer means comprising two identical discrete parts engaged together to form an annulus about the stem portion, the said fixed minimum spacing being such that the retaining means is positioned so that said portion of the split collar is maintained between said head portion and the retaining means.

4,093,294

RELEASABLE WIRELINE SPEAR

William T. Taylor, 222 Camp Lilly Rd., Humble, Tex. 77338

Filed Jun. 4, 1975, Ser. No. 583,774

Int. Cl.² E21B *31/02*

U.S. Cl. 294—86.25 **11 Claims**

1. A spear comprising

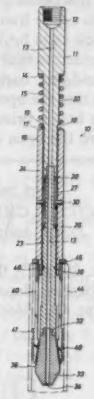
an elongate body having a connector means for supporting said body;

first means supported by said body;

an elongate set of collet fingers supported by said body and arranged in a circular fashion to engage the interior of a fish in a well, said fingers flexing to accommodate entry into the fish;

a tapered surface supported by said body adjacent to said collet fingers, said surface movable relative to said collet fingers which movement deflects said collet fingers radially inwardly and outwardly between fish engaging and disengaging positions;

cam means engaged by said first means which functions as a cam follower, said cam means and first means moving said collet fingers and tapered surface longitudinally of one another to deflect said collet fingers between fish engaging and fish disengaging positions, said cam means and said first means alternately moving between two positions, one associated with engaging and the other associated



with disengaging a fish, said cam means and said first means being constructed and arranged to operate between the engaging and disengaging positions on relative axial downward movement of said body, said cam means comprising a tubular member rotatably positioned around said body which is limited in axial movement along said body by a pair of spaced shoulders which capture said tubular member therebetween;

a sleeve telescoped over said body, said sleeve supporting a pair of radially inwardly directed pins which comprise said first means; and

said pins and said cam means forcing said body to move axially relative to said sleeve between the fish engaging and disengaging positions.

4,093,295

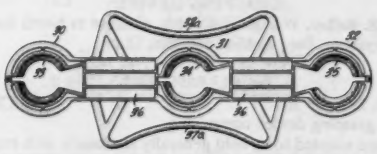
BOTTLE CARRIER

Gerald Erickson, Palm Beach, Fla., assignor to International Omni-Pak Corporation, Surfside, Fla.

Continuation of Ser. No. 587,895, Jun. 18, 1975, abandoned, which is a continuation of Ser. No. 462,110, Apr. 18, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 750,196

Int. Cl.² B65D *71/00*

U.S. Cl. 294—87.2 **3 Claims**



1. An integrally formed bottle carrier for carrying a single row of bottles comprising a plurality of spaced open-ended collars for receiving and supporting therein the necks of the

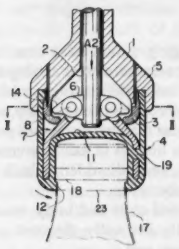
bottles, a longitudinally extending substantially rigid bridging bar connecting a pair of collars, an individual frame around and spacially separated from each collar and within which the respective collar is mounted, part of said frame forming a reinforcing edge of the adjacent rigid bridging bar, means connecting each collar to the individual frame to lend support thereto, diagonally extending legs connecting the open ends of each collar to the reinforcing edge of the adjacent rigid bridging bar to permit the open ends to be spread apart to receive the neck of a bottle, the extreme opposite of said longitudinally spaced collars in the carrier being oriented with the open ends facing inwardly opposite to each other and toward an adjacent rigid bridging bar to permit removal of either end bottle by pivoting the lower end thereof outwardly away from the adjacent bottle in the carrier, and a plurality of longitudinally extending reinforcing ribs beneath said rigid bridging bar and connecting the portions of the frames which form the opposite reinforced edges of each rigid bridging bar, said bottle carrier being further characterized in that there are at least two longitudinally extending bridging bars connecting at least three frames in a row and in that the open-ended collar intermediate a pair of rigid bridging bars is oriented longitudinally with the open end facing toward the open end of an adjacent collar.

4,093,296

BOTTLE GRIPPER

Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Co., Ltd., Onoda, Japan

Filed Jun. 20, 1977, Ser. No. 808,060
Claims priority, application Japan, Jun. 28, 1976, 51-75469
Int. Cl.² B66C 1/42
U.S. Cl. 294—90 **19 Claims**



1. A bottle gripper comprising a cylindrically shaped arm in the center of which a shaft is inserted with a loose fit, at the lower portion of the arm there being an inwardly projecting supporter, and a resilient cap formed of an outer cylinder, an inner cylinder extending therefrom to form a gap therebetween and a flat upper wall formed at the top of the inner cylinder, said shaft having branch plates at its lower end to which a plurality of swingable pieces are attached, each swingable piece having a projection at its upper end to be supported on said supporter and a skirt portion to be received in the gap between the outer and inner cylinders.

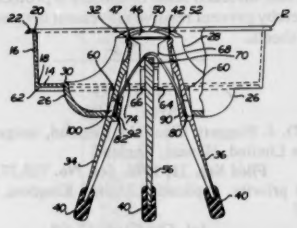
4,093,297

GRASPING DEVICE

Edwin E. Reiber, Worthington, Ohio, assignor to North American Systems, Inc., Bedford Heights, Ohio

Filed Nov. 29, 1976, Ser. No. 745,620
Int. Cl.² B25G 9/02
U.S. Cl. 294—99 R **10 Claims**

1. A grasping device comprising:
a frame adapted to be held generally stationary with respect to an article being grasped;
said frame comprising a generally flat support, an aperture in the support, and a support riser adjacent to the aperture in the support and projecting from the support;
two manually operable, movable tweezer legs supported by said frame;
a third leg positioned between the two movable tweezer legs and attached to said support riser and held generally stationary with respect to the frame so that each movable leg is movable relative to the third leg and the frame;
said two movable legs and said third leg each having a



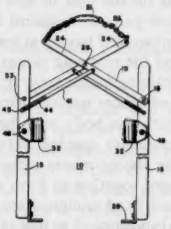
length such that all three legs terminate at approximately at the same point when the movable legs are closed against the third leg;
said movable legs being positioned and adapted for pivotal movement toward the third leg such that relative movement of the three legs lies in a common plane; and
means at the end of each leg for frictionally engaging an object to be grasped.

4,093,298

COMPRESSOR TONGS

Ralph M. Gatewood, Palmersville, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,793
Int. Cl.² B66C 1/28
U.S. Cl. 294—118 **3 Claims**



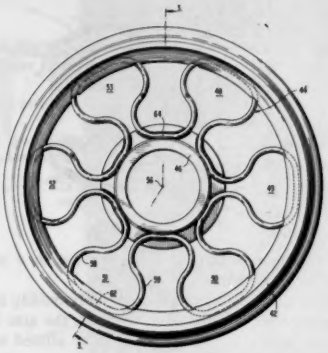
1. A tong assembly for gripping a cylindrical shaped body such as an air-compressor comprising,
a pair of vertical struts,
a pair of cross bars pivotally mounted together at an intermediate section of each cross bar, with a lower end of each cross bar pivotally mounted to an upper section of one vertical strut, with
a clamp bracket fixed to the lower end of each strut of a shape to fit under a corner of a cylindrical object, and with a clamp jaw, of a shape to fit about the curved side of said cylindrical object, pivotally mounted to an intermediate section of each strut, together with tension means fixed to the upper end of each cross-bar, said tension means suitable for suspending the assembly.

4,093,299

ARTICULATED RAILWAY SERVICE WHEEL AND UNITARY RAILWAY HUB AND AXLE

Overton B. Capps, Verona, and J. Richard Milliken, Pittsburgh, both of Pa., assignors to Edgewater Steel Company, Oakmont, Pa.

Filed Sept. 30, 1976, Ser. No. 728,115
Int. Cl.[2] B60B *17/00*
U.S. Cl. 295—14 17 Claims



1. Structure for assembly of an articulated railway service wheel comprising

rim means of toroidal configuration,

hub means, and

open web spring means for removably interconnecting the rim means to the hub means,

the rim means in an assembled wheel being rotatable with and circumferentially disposed with relation to the hub means with open spaces being defined by the spring web means between the rim means and hub means in an assembled wheel,

the open web spring means comprising elongated rodlike means defining a plurality of spring units which are distributed symmetrically between the rim means and hub means when in an assembled wheel,

receiving means on the rim means and hub means for receiving and seating the spring units during assembly of a wheel,

said receiving means being free of fastener means which are non-unitary with said rim means and said hub means, respectively while providing for removably interconnecting the rim means, spring web means, and hub means so as to permit predetermined relative movement between said structures,

said predetermined relative movement being limited during assembled usage to movement permitted by tensioning and compressing of the spring units,

each said spring unit having a generally U-shaped configuration when projected onto a plane in perpendicular relationship to the axis of rotation of an assembled wheel,

each said generally U-shaped configuration spring unit comprising

a pair of elongated legs extending between the rim means and the hub means establishing a resultant directional component for each said leg which is radial of an assembled wheel,

said leg means presenting a curvilinear configuration when projected onto a plane in perpendicular relationship to the axis of rotation of an assembled wheel,

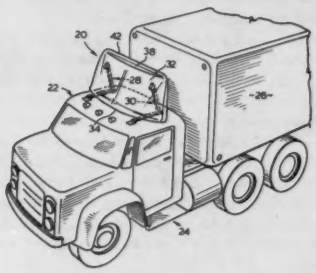
said curvilinear configuration of the leg means changing in response to vertical and lateral forces applied through the hub means and rim means in an assembled wheel when in use.

4,093,300

AIR DEFLECTOR

Heinz Werner Snizek, 45 Grenoble Drive, Apt. 2205, Don Mills, Ontario, Canada

Filed Jun. 21, 1976, Ser. No. 697,811
Int. Cl.[2] B62D *37/00*
U.S. Cl. 296—1 S 9 Claims



1. An air deflector for use with a road vehicle of the kind which is adapted for travel forwardly along a path of travel and which has a cab and a load-carrying body section disposed rearwardly of and extending above said cab, said deflector having a streamlined air deflecting face and being adapted to be mounted on said cab in front of said body portion with said air deflecting face facing generally forwardly and with said face disposed generally transversely of said path of travel, said face having the following features, which are defined with reference to an orientation of said face forwardly and disposed generally across said path of travel and oriented for movement along a horizontal said path of travel:

(a) a bottom leading edge,

(b) a first region extending from said bottom leading edge and sloping generally rearwardly and upwardly therefrom, said first region having an upper section sloping upwardly and rearwardly at a relatively steep angle to the horizontal,

(c) a second region extending from the upper margin of said upper section and sloping upwardly and rearwardly therefrom at a relatively shallow angle to the horizontal,

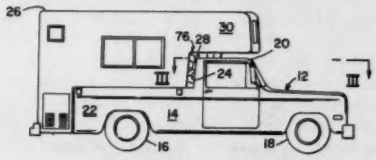
(d) a third spoiler region formed by a flange-like portion of said deflector, said spoiler region extending from the upper margin of said second region and forming an upper margin of said deflector, said spoiler region being disposed in a generally upright position so that air flowing over said face is deflected upwardly by said spoiler region as the air leaves the deflector.

4,093,301

MOVABLE DOOR FOR A VEHICLE

Samuel W. T. Kwok, 2642A Baldwin La., Walnut Creek, Calif. 94596

Filed Sep. 27, 1976, Ser. No. 727,262
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—23 MC 10 Claims



1. In combination, a truck including a cab defining a laterally directed rear wall and a longitudinally directed, generally horizontal bed for supporting a load extending rearwardly from said cab,

an enclosed camper body defining a laterally directed forward wall facing said rear wall of said truck cab,

a first opening in said rear wall of said truck cab,

a corresponding second opening in said forward wall of said camper body, said cab and camper body openings being aligned, one with the other,

said camper body being positioned rearwardly of said truck cab so as to define a space between said truck cab rear wall and said camper body forward wall,

a first slidable door and means on said truck cab rear wall for sliding said first door laterally between a first position obturating said first opening in said rear wall of said truck cab to a second position uncovering said first opening and within said space, and,

a second slidable door and means on said forward wall of said camper body for sliding said second door laterally in a direction opposite to the direction of sliding of said first door, between a first position obturating said second opening to a second position uncovering said second opening so that passengers may move to and from said cab and said camper.

4,093,302

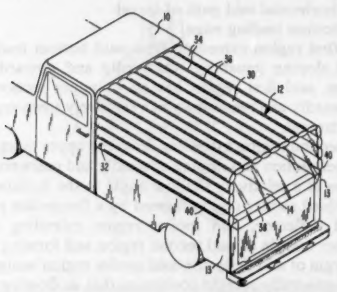
VEHICLE COVER ASSEMBLY

Robert Michael Adams, 4018 Redwood Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 654,623, Feb. 2, 1976, abandoned. This application Mar. 10, 1976, Ser. No. 665,564

Int. Cl.[2] B60P *3/34*

U.S. Cl. 296—23 R **23 Claims**



1. A camper cover adapted for attachment to a vehicle having a cargo area, said camper cover comprising:

a plurality of longitudinally spaced-apart, transverse frame members having an upper portion and depending side portions and adapted for mounting on a vehicle to form a camper frame over the cargo area of a vehicle;

an inflatable cover member having a front edge, a rear edge and two side edges and formed of opposed flexible, air tight sheets seamed together to form an inflatable enclosure between said sheets, said opposed sheets being further attached together by a plurality of elongated seams to form adjacent, longitudinal, inflatable sections within said enclosure, said inflatable sections being in gas communication and having means for introducing a gas into said inflatable cover member, said inflatable cover member adapted to fit over the camper frame formed by said frame members to form a camper cover; a plurality of longitudinal bracing members extending between adjacent frame members to form a V brace; and

means for securing said two side edges of said inflatable cover member to the sidewalls of the cargo area of the vehicle.

4,093,303

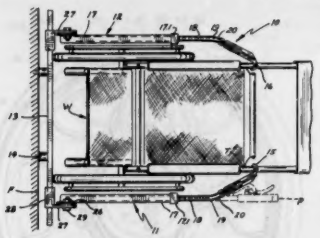
WHEELCHAIR RETAINING APPARATUS FOR VEHICLES

Eldrid W. Nelson, Minneapolis, Minn., assignor to Chas. Olson & Sons and Wheel Service Co., Inc., St. Paul, Minn.

Filed Feb. 28, 1977, Ser. No. 772,457

Int. Cl.[2] B60N *1/02*; B60P *7/08*; B61D *45/00*; B62B *11/00*

U.S. Cl. 296—65 R **26 Claims**



1. A wheelchair retaining device for use in a passenger carrying vehicle, comprising:

an elongate arm to extend generally horizontally alongside of the wheelchair from back to front, the arm having a rear end with attachment means to be affixed to a rigid part of the vehicle, the arm having a transversely extending front end to traverse the plane of the chair wheel and confront the tire of the wheel;

a releasable clamping jaw on the front end of the arm and facing rearwardly to embrace the frame of the wheelchair; and

articulated means in the arm permitting the front end of the arm and the clamping jaw to move in a transverse direction to swing away from the wheelchair frame and out of the way of the wheel of the chair.

4,093,304

HOLDING MEANS FOR A WINDOW, PREFERABLY WINDSHIELD IN VEHICLES

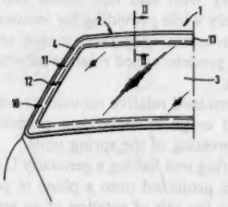
Hermann Ziegler, Renningen, Germany, assignor to Dr. Ing. h.c.F.Porsche Aktiengesellschaft, Germany

Filed May 7, 1976, Ser. No. 684,022

Claims priority, application Germany, May 7, 1976, 2520320

Int. Cl.[2] B60J *1/02*

U.S. Cl. 296—84 D **11 Claims**



1. In an arrangement for attaching a windshield to the windshield frame of an automobile by way of an adhesive material, the improvement comprising:

an easily removable member attached to said windshield frame,

said adhesive joining said windshield to said easily removable member,

wherein said easily removable member is at least in part U-shaped in cross-section and said windshield frame has a flange portion which is at least partially surrounded by said U-shaped part, and

wherein part of said flange portion of said windshield frame

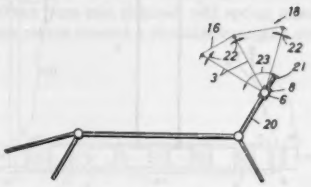
is cambered and the adjoining part of said easily removable member is provided with a camber so as to be retained against the cambered part of said flange portion of said windshield frame.

4,093,305

SUN PROTECTION

Joachim Staroste, Steinhaagweg 9, 6490 Schluchtern-Niederzell, and Peter Heuer, Nordstr. 25, 6497 Steinau, both of Germany

Filed Feb. 4, 1977, Ser. No. 765,674
Claims priority, application Germany, Dec. 11, 1976, 2656245
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—184 **9 Claims**



1. A sun protection, especially for use with deck chairs, camping chairs, or the like, said sun protection comprising a plurality of U-shaped supporting beams each of which includes a central cross beam, a pair of laterally spaced apart side beams, a pair of angular connections for removably coupling the opposed ends of said central beam to one end of each of said side beams, a mounting ear removably connected to the end of each said side beam that is opposite said respective cross beam, a pair of clamping holders coupled to the end of said side beams opposite said respective cross beam for detachably securing said sun protection to a chair, a pair of clamping bolts adjustably coupling said mounting ears to each other and to a respective one of said clamping holders, said U-shaped supporting beams being angularly displacable with respect to each other and being angularly displacable as a unit with respect to said clamping holders, said clamping holders being formed as angular elements in one of which is removably disposed one of said clamping bolts in a torsion-resistant manner, and a foldable fabric covering said U-shaped supporting beams.

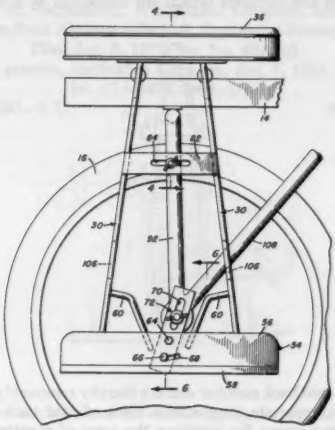
4,093,306

AUXILIARY RIDER SUPPORT FOR JOG CARTS

Joseph Zitone, R.F.D. 1, Port Jervis, N.Y. 12771

Filed Mar. 25, 1977, Ser. No. 781,364
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—217 **14 Claims**

1. For use on a jog cart incorporating a pair of forwardly directed shafts and a cart frame mounting said shafts on wheels, a quick attaching and readily detachable auxiliary rider support, said support comprising an upright frame having an inner side and an outer side, said support frame also having an upper portion and a lower portion, hook means on the upper portion of the support frame inwardly directed for engagement over a jog cart shaft in general alignment over a wheel, locking means on the support frame below the hook means and inwardly directed for releasable engagement with a jog cart to, in conjunction with the hook means, releasably fix the rider support to the jog cart, said rider support including a rider accommodating seat mounted on the upper portion of the support frame and a footrest mounted on the lower portion of



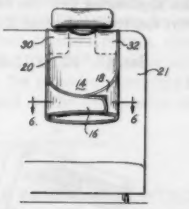
the support frame, said footrest projecting outwardly from the support frame.

4,093,307

VEHICLE RESTRAINING BELT STRUCTURE

Ronald A. McLennan, 520 Maple Row, Elkhart, Ind. 46514

Filed Oct. 22, 1976, Ser. No. 734,870
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—385 **9 Claims**



1. A passenger restraining belt structure for use with a vehicle seat having a back, comprising a body for engaging the front of the back of the seat, straps connected to said body and extending laterally therefrom, with both the top and bottom edges of each strap extending downwardly, to a position near the midsection of an adult passenger for overlapping one another in front of the passenger and at least partially supporting the weight of the passenger's body, the top and bottom edges of each strap extending generally in a parallel direction and the top edge being the normal position of the passenger's arm pit, means for securing said straps together with the straps around the body of the passenger, an upper portion attached to said body for extending over the top of the back of the seat, and means for attaching said upper portion to the back of the seat back.

4,093,308

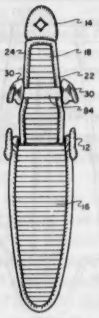
DENTAL OPERATING CHAIR WITH RESTRAINING ARM SUPPORTS

Robert R. Runnells, Kaysville, Utah, assignor to MDT Instrument Company, Tualtin, Oreg.

Filed May 10, 1976, Ser. No. 684,659
Int. Cl.[2] A47C *7/54*
U.S. Cl. 297—416 **5 Claims**

1. In a dental operating chair of the type including a movable

back member which can be moved to position a patient in said chair in a substantially supine posture, wherein the back member has opposite longitudinal sides, the improvement which comprises arm supports which are connected by a band that



encircles said back member and are thereby removably secured along said opposite longitudinal sides of said back member constituting means for retaining the arms of a patient proximate the body trunk of said patient when said patient is in supine posture in said chair.

4,093,309

METHOD OF AND APPARATUS FOR CONTROLLING ADVANCE OF UNDERGROUND ARMORED CONVEYORS

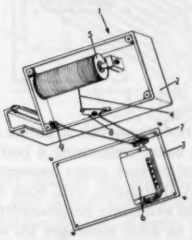
Rex Mullins, Burton upon Trent, England, assignor to Coal Industry (Patents) Ltd., London, England

Continuation-in-part of Ser. No. 605,837, Aug. 19, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,438

Claims priority, application United Kingdom, Oct. 24, 1974, 45996/74

Int. Cl.² E21D *15/48*

U.S. Cl. 299—1 **3 Claims**



1. A method of controlling advance of an armored conveyor arranged along an underground mine longwall face having roadways adjacent to its ends, the conveyor comprising a series of articulated sections advanceable with respect to the fact in snake-like manner by a plurality of advancing mechanisms spaced along the length of the conveyor, comprising advancing the conveyor sections towards desired advance positions, detecting the advances of a plurality of said conveyor sections arranged over substantially the length of the conveyor, said detecting being done by means including a wound elongate member anchorable at one end for unwinding as the conveyor is advanced toward the longwall, the advances being indicated by signals corresponding to the unwound length of the member, comparing the summed detected advances, and controlling subsequent advances of the conveyor sections such that the relative advance of substantially the whole conveyor length tends to be maintained at the same distance from an initial base line, the straightness of the conveyor is maintained within preselected-limits and the summed advances of the conveyor sections adjacent to the ends of the conveyor are such that the angle of the substantially straight conveyor with respect to said roadways is maintained within a further preselected limit.

4,093,310

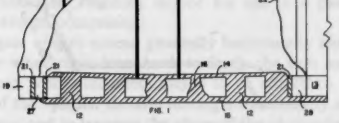
SEALING AN UNDERGROUND COAL DEPOSIT FOR IN SITU PRODUCTION

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Division of Ser. No. 774,597, Mar. 7, 1977. This application Sep. 19, 1977, Ser. No. 834,182

Int. Cl.² E21B *33/13*

U.S. Cl. 299—2 **6 Claims**



5. A method of sealing an underground coal deposit wherein a subsidence crack forms a communication passage between the surface of the earth and the said underground coal, comprising the steps of

injecting a fluid into the said subsidence crack, the said fluid having the capability of sealing the said subsidence crack, sealing the said subsidence crack, and

continuing injecting the said fluid into the said subsidence crack until sufficient fluid head pressure is established to withstand planned mine pressure within the said underground coal.

4,093,311

ARRANGEMENT FOR CLAMPING VEHICLE WHEELS

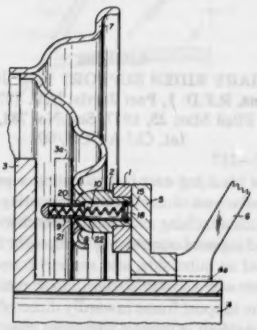
Otfrid Maus, Darmstadt, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Filed Sep. 27, 1976, Ser. No. 726,814

Claims priority, application Germany, Jan. 26, 1976, 2602738

Int. Cl.² B25H *5/00*

U.S. Cl. 301—9 DH **9 Claims**



1. An apparatus for clamping a vehicle wheel rim having mounting holes therein to hold the respective wheel in a rotatable position, comprising rotatable backing means, a clamping

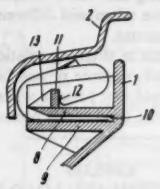
device including wheel centering means for engaging a mounting hole in said vehicle wheel rim, said wheel centering means comprising centering bolt means secured to said clamping device, said centering bolt means extending toward said backing means, guide pin means extending from said centering bolt means also toward said backing means, biasing spring means cooperating with said guide pin means for yieldingly urging said guide pin means toward said backing means, said centering bolt means comprising a first bolt portion rigidly mounted to said clamping device and a second bolt portion operatively connected to said first bolt portion, said second bolt portion having a contoured surface facing toward said backing means for engaging a mounting hole, said centering bolt means further comprising a central, axially extending channel therein, said guide pin means and said biasing spring means being located in said central, axially extending channel of said centering bolt means, said guide pin means and said channel comprising cooperating shoulder means inhibiting the removal of said guide pin means from said channel, said spring means urging said guide pin means toward a shoulder engaging position.

4,093,312

FASTENING ARRANGEMENT FOR DECORATIVE WHEEL RINGS

Paul Kretschmer, Höhenstr. 18, 8752 Waldaschaff, Germany

Filed Oct. 21, 1976, Ser. No. 734,442
Claims priority, application Germany, Oct. 21, 1975, 2547064
Int. Cl.² B60B 7/06
U.S. Cl. 301—37 R **2 Claims**



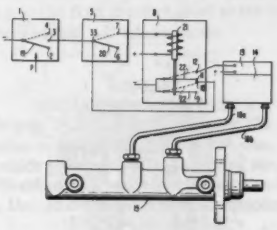
1. A decorative wheel ring comprising at least two spring clips for engagement in the rim of a wheel of a motor vehicle, the decorative wheel ring being provided with a clip support portion for each spring clip, wherein each spring clip has the form of a three-legged spring loop comprising an outer free leg joined at its one end to a central portion through a first bent portion, and an inner free leg joined to said central portion through a second bent portion, including tangs on said central portion which, after the decorative wheel ring together with said spring clips inserted in said clip support portions has been pressed into the wheel dish of the rim, engage the wall of the wheel dish and thus hold the decorative wheel ring freely suspended on the wheel of the vehicle, each clip support portion on the decorative wheel ring being provided with an axially extending guide slot adapted to receive said outer free leg of the spring loop of the spring clip, wherein said clip support portion also contains a projecting extension serving as an axial stop for the inner free leg of said spring loop of the spring clip which embraces said extension and forces said tangs against said rim thereby to secure said ring.

4,093,313

TWO-CIRCUIT BRAKE SYSTEM FOR MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Jun. 8, 1977, Ser. No. 804,743
Claims priority, application Germany, Jun. 9, 1976, 2625713
Int. Cl.² B60T 8/04, 8/18
U.S. Cl. 303—6 C **10 Claims**



1. A two-circuit brake installation for motor vehicles, comprising a shiftable master brake cylinder means including two pressure space means for the two brake circuits, said two pressure space means being connected with each other by a line extending outside of the master brake cylinder means, a shifting valve means arranged in said line which is operable in dependence on the vehicle load to establish and interrupt the connection between the two pressure space means, and an intermediate piston in the master brake cylinder means between said two pressure space means, said intermediate piston being arranged substantially coaxially to two pressure points and being freely movable within a guide sleeve means of smaller diameter, said intermediate piston being provided on both sides thereof with central extensions for the mechanical cooperation with the two pressure pistons, characterized by control means for shifting the shifting valve means in dependence on the load, on the pressure prevailing in the master brake cylinder means and on the deceleration attainable with such pressure.

4,093,314

HYDRAULIC BRAKE PRESSURE CONTROL DEVICE

Asao Kozakai, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 22, 1976, Ser. No. 753,583
Claims priority, application Japan, Dec. 30, 1975, 50-156968
Int. Cl.² B60T 8/24
U.S. Cl. 303—24 F **6 Claims**

1. In an hydraulic brake system for a vehicle including a master cylinder, two wheel brake cylinders located on opposite sides of the vehicle at the same point along the longitudinal axis of the vehicle in separate hydraulic communication with the master cylinder, the communication defining two pressure boundaries, a brake pressure proportioning unit for supplying equal reduced braking pressure to both brake cylinders during straight-ahead vehicle motion and proportioned reduced braking pressure to the brake cylinders during lateral vehicle motion, said reduced pressures being relative to the master cylinder pressure, the unit having

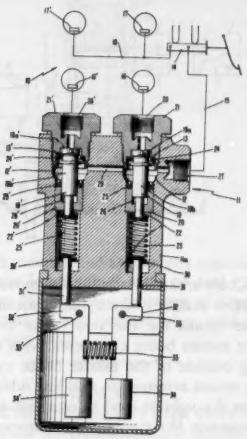
(i) two proportioning valves, one valve interposed in each of the separate hydraulic communications for supplying reduced wheel brake pressure to the respective wheel cylinder for master cylinder pressure greater than a predetermined valve setpoint,

(ii) two springs each associated with a respective one of the proportioning valves, each of the springs being biased, the respective predetermined setpoint being established by the exerting force of the respective one of the biased springs,

(iii) two weights each movable in response to centrifugal

force caused by the lateral motion of the vehicle during a turn, and

(iv) first and second lever means each applying the force of a respective one of the weights upon one of the springs, the first and second lever means being responsive to the movement of the respective weight for increasing the spring exerting force and the setpoint of the valve supplying reduced pressure to the brake cylinder outboard of the vehicle turning path and decreasing the spring exerting



force and the setpoint of the valve supplying reduced pressure to the inboard brake cylinder relative to the respective predetermined setpoints with no lateral vehicle motion,

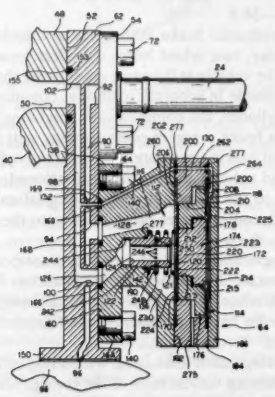
the improvement comprising mechanical link means interacting between the springs for automatically equalizing the exerting forces of the springs and the valve setpoints in the absence of lateral vehicle motion, said link means connecting the first and second lever means.

4,093,315

MODULATING VALVE ASSEMBLY FOR RAILROAD CAR BRAKE CYLINDERS

William R. Page, 400 E. Randolph St., Chicago, Ill. 60601, and James G. Rees, 1212 Lake Shore Dr., Chicago, Ill. 60610

Filed Jul. 5, 1977, Ser. No. 813,005
Int. Cl.[2] B60T *11/12*
U.S. Cl. 303—59 **17 Claims**



1. In a brake cylinder for railroad car air brake equipment including a brake cylinder pipe connected to the brake cylinder head for communicating fluid under pressure to the brake cylinder from the outlet of the brake cylinder pipe to the inlet of the brake cylinder head, a modulating valve assembly therefor for supplying the braking pressure fluid to the brake cylinder from the brake cylinder pipe at a pressure that is a predetermined percentage of the pressure fluid in the brake cylinder pipe for brake service strokes above minimum service applications, said assembly comprising:

a bracket plate interposed between the brake cylinder pipe outlet and brake cylinder head inlet,

said bracket plate being formed to define a first passage communicating with the brake cylinder pipe outlet and a second passage communicating with the brake cylinder inlet,

a modulating valve device carried by said bracket plate,

said valve device comprising:

a housing defining a cavity,

a differential valve member mounted across said cavity to define first and second chambers on either side of said valve member and for flexing movement laterally of said valve member,

said bracket plate first passage being in free communication with said first chamber,

an annular valve seat positioned in said first chamber adjacent said valve member, with said bracket plate second passage being in communication with said first chamber through said valve seat, and said valve member being mounted to be flexed against said seat for sealing off communication of said second passage to said first chamber,

said second chamber being in free communication with said bracket plate second passage,

said valve member having exposed in said chambers on either side of same working areas of which the working area exposed to said second chamber is greater than the working area of same that is exposed to said first chamber by a predetermined ratio, whereby when said chambers are subject to fluid pressure in said passages, said valve member will be subject to a differential pressure force biasing same toward said seat,

means for spring biasing said valve member away from said seat that is overcome when said differential force reaches a predetermined amount,

and check valve means in shunting relation to said seat for releasing fluid under pressure in said brake cylinder and second passage to said first passage when said brake cylinder pipe is free of the fluid under pressure.

4,093,316

COMBINED ANTISKID AND LOAD-DEPENDENT BRAKE CONTROL SYSTEM FOR A MOTOR VEHICLE

Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse GmbH, Hanover, Germany

Filed Feb. 24, 1977, Ser. No. 771,477
Claims priority, application Germany, May 21, 1976, 2622746
Int. Cl.[2] B60T *8/02, 8/18*
U.S. Cl. 303—100 **6 Claims**

1. An antiskid brake control system for motor vehicles comprising:

(a) a reservoir in which fluid under pressure is stored;

(b) a brake cylinder device for each wheel of the vehicle;

(c) an operator controlled brake valve device via which the fluid pressure from said reservoir is supplied to said brake cylinder devices in accordance with the degree of braking desired;

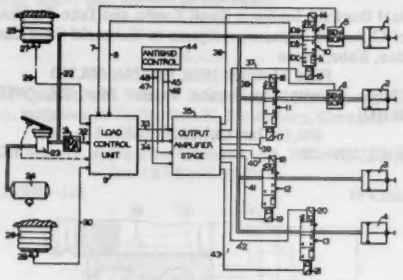
(d) valve means interposed between said brake valve device and said brake cylinder devices for influencing braking pressure independently of said brake valve device;

(e) antiskid control means for effecting operation of said valve means during wheel skid conditions;

(f) sensor means for providing output signals corresponding to the brake valve regulated supply fluid pressure, the

effective brake cylinder pressure and the load supported by the respective axles of the vehicle; and

(g) load control means subject to the sensor output signals for effecting operation of said valve means to influence the fluid pressure of said brake cylinder device of a chosen



one of the respective vehicle axles so as to follow a predetermined brake cylinder pressure buildup curve that deviates from a normal buildup curve at a predetermined point thereon corresponding to the time when the brake valve supply pressure signal exceeds the signal of the load supported by the chosen axle.

4,093,317

VEHICLE ANTISKID BRAKE CONTROL SYSTEM HAVING MEANS FOR ADJUSTING A NON-SENSED WHEEL BRAKE PRESSURE RELATIVE TO A SENSED WHEEL BRAKE PRESSURE

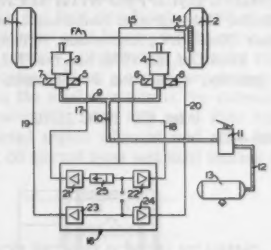
Klaus Lindemann, Hanover; Lutz Weise, Misburg, and Erich Reinecke, Beinhorn, all of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Germany

Filed May 27, 1977, Ser. No. 801,435

Claims priority, application Germany, Jun. 18, 1976, 2627284

Int. Cl.[2] B60T *13/68*

U.S. Cl. 303—111 **19 Claims**



1. An antiskid brake control system for the fluid pressure operated brakes of a vehicle having at least a pair of axles with a wheel at each end thereof, said system comprising:

(a) a storage tank normally charged with fluid pressure;

(b) a brake cylinder device for each wheel of the vehicle;

(c) a fluid pressure conduit extending from said tank to each said brake cylinder device;

(d) a brake valve device in said conduit for controlling the supply of fluid pressure from said tank to said brake cylinders and for controlling the release of said brake cylinder fluid pressure;

(e) sensor means for providing output signals in accordance with the dynamic behavior of but a single wheel of at least one axle;

(f) evaluation means for providing control signals in accordance with said output signals from said sensor means;

(g) control valve means for modulating the fluid pressure of each said brake cylinder device in response to said control signals in order to adjust the brake cylinder pressure at the respective wheels independently of said brake valve device;

wherein the improvement comprises,

(h) delay means for varying the degree of fluid pressure adjustment by said control valve means at said brake cylinder device of one of said wheels of an axle relative to the other of said wheels of the same axle, such as to preclude the fluid pressure at the brake cylinder of a wheel without said sensor means from attaining a level corresponding to the fluid pressure level at the brake cylinder of a wheel having said sensor means.

4,093,318

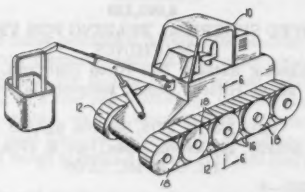
ENDLESS DRIVE SYSTEM

John W. Edwards, P.O. Box 1151, Brandon, Fla. 33511

Continuation-in-part of Ser. No. 590,938, Jun. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 576,641, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 532,698, Dec. 13, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,527

Int. Cl.[2] B62D *55/20*

U.S. Cl. 305—11 **50 Claims**



1. An endless drive system comprising:

a plurality of endless drive sections, each section including a substantially closed contact surface and inwardly sloped, substantially closed side surfaces extending from first and second sides of said contact surface toward the center of the endless drive system and forming therewith a body portion having a substantially closed periphery;

connecting means for pivotally connecting the portions of said endless drive sections adjacent the center of the drive system to enable movement of said endless drive system in an endless path; and

shield means extending from each body portion and overlapping an adjacent endless drive section for maintaining a substantially closed structure between adjacent endless drive sections as said endless drive system travels in an endless path.

4,093,319

TRACK CONSTRUCTION FOR TRACKED LAND VEHICLES SUCH AS TANKS

Hans G. K. Börner, Blieskastel-Mimbach, Germany, assignor to Gerlach-Werke GmbH, Germany

Filed Sep. 24, 1976, Ser. No. 726,110

Claims priority, application Germany, Mar. 19, 1976, 2611681; Dec. 6, 1975, 2554980

Int. Cl.[2] B62D *55/20*

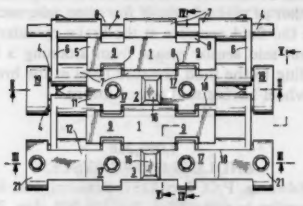
U.S. Cl. 305—58 R **14 Claims**

1. A track construction for land vehicles, such as tracked armored vehicles, said track construction comprising:

a plurality of track members each comprising first and second spaced, parallel sets of transversely extending tubular members, said sets each comprising at least two tubular members mounted in axially spaced relationship so as to define a gap therebetween and having axially aligned bores therein, said track members each including a wheel contacting surface located thereon;

a plurality of connection members each including a wheel contacting surface;

and connecting means, including a pair of connecting pins extending through resilient sleeves mounted in said aligned bores of said sets of tubular members, for connecting said connection members and said track members



together in alternating relationship to form a track, said connection members including ground engaging means affixed thereto on the sides thereof opposite to said wheel contacting surfaces and extending in both longitudinal directions of the track beyond the two connecting pins of the connection member.

4,093,320

GROOVED SPHERICAL BEARING FOR VERTICAL MACHINES

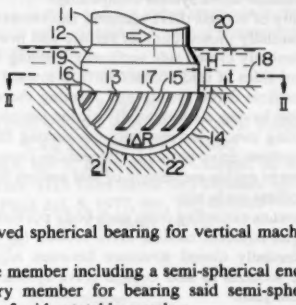
Ryoichi Kaneko; Katutosi Nii; Hiroo Hiroyama, and Kinpei Okano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 5, 1975, Ser. No. 629,623

Claims priority, application Japan, Nov. 8, 1974, 49-127993

Int. Cl.[2] F16C *32/06*

U.S. Cl. 308—9 19 Claims



1. A grooved spherical bearing for vertical machines comprising:

a rotatable member including a semi-spherical end portion;

a stationary member for bearing said semi-spherical end portion of said rotatable member;

a plurality of grooves formed on the surface of said semi-spherical end portion of said rotatable member, said surface adapted to be brought into sliding contact with the surface of said stationary member, said grooves being arranged such that they perform the function of drawing lubricating oil, in which said semi-spherical end portion and said stationary member are immersed, toward the sliding surfaces of the two members as said rotatable member rotates;

means for reducing resistance of the lubricating oil flow directed along the sliding surfaces caused by a flow of the lubricating oil being radially forced by inertia of said rotatable member, and wherein each of said plurality of grooves has an intake portion for said lubricating oil disposed at a major diameter surface of said semi-spherical end portion and an outlet portion for said lubricating oil disposed at a minor diameter surface of said semi-spherical end portion, and wherein said resistance reducing means includes an edge portion of said stationary bearing member extending in an axial direction of said rotatable member by a predetermined distance upstream of said intake portion.

4,093,321

TAPER JOURNAL BEARING FOR ROLLS FOR USE IN ROLLING MILLS

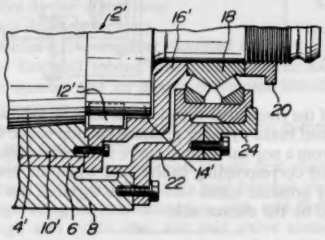
Koichi Ikariishi, Ichihara; Kanji Kondo, and Toko Teshiba, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 19, 1976, Ser. No. 668,723

Claims priority, application Japan, Mar. 29, 1975, 50-41481[U]

Int. Cl.[2] F16C *3/00*

U.S. Cl. 308—20 7 Claims



1. A taper journal bearing for rolls for use in rolling mills, comprising a bushing housed in a roll bearing box, a sleeve closely fitted onto a taper journal of the roll, an oil film deposited between said bushing and said sleeve, and means for fixing said sleeve to said roll, said fixing means arranged at an area other than that directly subjected to a rolling force acting upon said sleeve, the rolling force being transmitted from said roll bearing box.

4,093,322

SLIDE BEARING FOR USE IN A COMBUSTION ENGINE AND ENGINE EQUIPPED WITH SUCH A BEARING

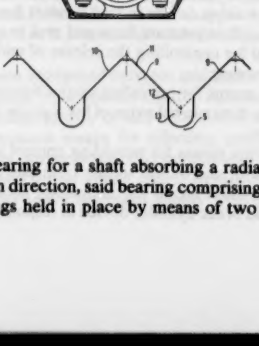
Karel Koskuba, Duivendrecht, Netherlands, assignor to Stork-Werkspoor Diesel B.V., Amsterdam, Netherlands

Filed Oct. 12, 1976, Ser. No. 731,448

Claims priority, application Netherlands, Oct. 10, 1975, 7511971

Int. Cl.[2] F16C *25/02*

U.S. Cl. 308—23 12 Claims



1. A slide bearing for a shaft absorbing a radial load on the shaft varying in direction, said bearing comprising two or more bearing bushings held in place by means of two bearing caps

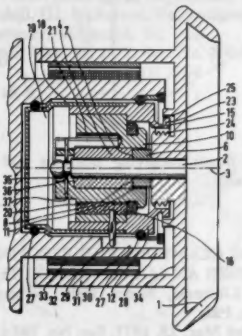
provided at their boundary surfaces with meshing teeth securing them against relative displacements, each tooth having slanting opposite side faces such that adjacent faces of adjacent teeth of each bearing cap extend convergently downwardly to define a valley, the bottom of the valley between each pair of adjacent teeth of at least one bearing cap having a groove extending below said bottom of the valley.

4,093,323

ROTOR BEARING

Gerhard Quandt, and Werner Ries, both of Heidelberg, Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Jul. 14, 1976, Ser. No. 705,004
Claims priority, application Germany, Jul. 29, 1975, 2533804
Int. Cl.² F16C *32/06*
U.S. Cl. 308—121 **19 Claims**



1. In a bearing for the rotor of a rotary device, the bearing being composed of an oil-lubricated slide bearing bush and a journal pin connected to the rotor and mounted in the bush for rotation relative thereto, the bush presenting a cylindrical surface providing support for the pin in the radial direction, and means for yieldingly mounting the bush, the improvement comprising: a bearing ring mounted to rotate with the rotor and having an axial end face ring forming, with an axial end face of said bush, an axial slide bearing for the rotor, said axial bearing receiving a supply of lubricating oil during rotation of said device; and means defining a narrow annular gap extending substantially in the axial direction in the vicinity of, and spaced radially outwardly from, said axial slide bearing to provide a constricted region adjacent said axial bearing at which lubricating oil ejected from said axial bearing accumulates.

4,093,324

SEAL FOR SELF-ALIGNING BEARING

Erwin R. Carrigan, Manchester, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 16, 1977, Ser. No. 797,278
Int. Cl.² F16C *33/80*
U.S. Cl. 308—187.1 **8 Claims**

1. In a free-running bearing seal axially assembled in an annular space between a journalled shaft and a bearing housing, comprising:

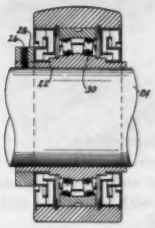
a first annular member of channel form in cross section having a radially extending web portion and an axially extending flange at each end thereof,

a second annular member of channel form in cross section having a shorter radially extending web portion and an axially extending flange at each end thereof,

said first and second members being arranged with their radial web portions coextending, with their flanges extending toward each other, and with their flanges at one end in axial alignment, whereby said first and second members together have the form in cross section of a block letter "G,"

a third annular member of generally block letter "S" form in cross section has first and second outer oppositely extending axial portions, an intermediate axial portion, a first radially extending portion connecting said intermediate axial portion with said first outer axial portion, and a second radially extending portion connecting said intermediate and second outer axial portions,

said third member having its first radial portion positioned between and coextending with said radially extending web portions of said first and second members, with its intermediate axial portion lying between and coextending



with said flange portions at the said other ends of said first and second members, with its first outer axial portion lying between the flanges of said second member and extending to a free end toward the web portion of said second member, with its second outer and intermediate axial portions lying on opposite side of and coextending with said flange at the said other end of said first member, and

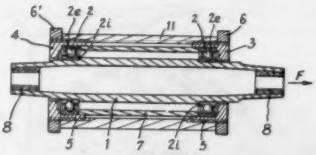
said radially and axially coextending portions of said members being spaced and the free ends of said axially extending portions being spaced from adjacent radially extending portions to permit free relative rotation between said first said second members and said third member.

4,093,325

TUBULAR SPINDLE MOUNTING FOR BICYCLE BOTTOM-BRACKET HUB

Roger Troccaz, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Oct. 29, 1976, Ser. No. 737,003
Claims priority, application France, Oct. 30, 1975, 75 33142
Int. Cl.² F16C *33/00*
U.S. Cl. 308—192 **3 Claims**



1. Bottom bracket hub of the ball-bearing type, comprising a hollow tubular spindle of relatively reduced wall thickness, means for effecting the axial adjustment of said spindle, a pair of bearings associated with, and mounted on, said spindle, and a pair of inserts rigidly fitted in the hollow ends of said spindle, wherein the hub body receives therethrough the hollow tubular spindle carrying the two bearings each provided with an outer race, characterised in that the outer races of said bearings are disposed in a pair of screw-threaded bushings, respectively, of which at least one is adapted to move axially in relation to the outer race of the relevant bearing, said bushings constituting the axial play adjustment members and being on the other hand screwed in the tapped body of said hub.

4,093,326

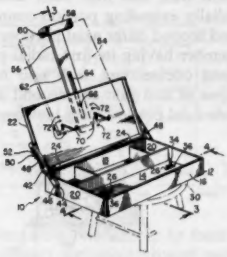
ARTIST'S KIT

Thomas Edward Ford, 150-24 6th Ave., Whitestone, N.Y. 11354

Filed May 11, 1976, Ser. No. 685,438

Int. Cl.[2] A47B *97/04*

U.S. Cl. 312—231 **12 Claims**



1. An artist's kit comprising:

a. a rectangular box for holding artist's materials including a base and a front wall, a rear wall and side walls all vertically disposed with respect to said base, and further including a cover;

b. means mounting said cover to said box for pivotal movement between a closed position wherein said cover overlays the walls of said box and any one of a plurality of open positions; and

c. means partly disposable within and without said box for releasably clamping said kit to an external mounting surface including means for biasing the base of said box against said mounting surface for effecting the clamping of said box to said mounting surface, wherein the releasable clamping means includes means defining at least two apertures in said bias, a pair of mounting members each having a first portion positionable beneath the mounting surface and a second portion connected to said first portion and extendable through one of said apertures and wherein said biasing means is disposable within said box for acting on each of said second portions for biasing each first portion against the underside of the mounting surface.

4,093,327

HAND GRIP ASSEMBLY FOR MOVABLE CABINET

Harrison K. Linger, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 26, 1976, Ser. No. 735,603

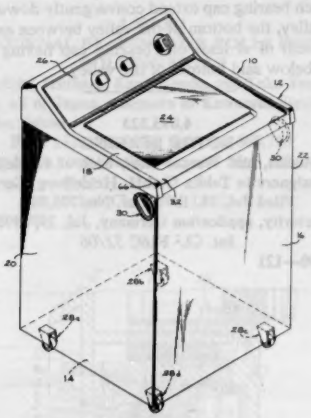
Int. Cl.[2] A47B *95/02;* **A47F** *4/08;* **B65D** *25/06*

U.S. Cl. 312—244 **7 Claims**

1. In a portable cabinet including a bottom, front, top, and two side walls, an improved hand grip assembly comprising:

a finger receiving portion secured to each of the side walls and located on a line diagonally across the corner of each of the side walls near the top and front walls, and

a recess area in the top wall for receiving a thumb, said recess area being inwardly of each of the side walls and spaced relative to each of the finger receiving portions such that both hands of a person are accommodated in the



respective finger receiving portions and thumb recess simultaneously.

4,093,328

DEVICE FOR CLAMPING AND EJECTING FROM A CONTAINER AN AUTORADIO OR THE LIKE

Giulio Cesare Libianchi, Rome, Italy, assignor to Autovox S.p.A., Rome, Italy

Filed Mar. 23, 1977, Ser. No. 780,613

Int. Cl.[2] E05B *73/00;* **F16B** *41/00*

U.S. Cl. 312—333 **13 Claims**

1. A clamping and ejecting assembly for a support structure adapted to receive an apparatus, such as an autoradio or the like having complimentary clamping means thereon, said assembly comprising:

support means for receiving and supporting an apparatus having complimentary clamping means thereon;

spring element means mounted to said support means and reciprocally movable with respect to said support means between a first retracted position and a second extracted position;

clamping means arranged upon and movable with said spring element means for matingly engaging said complimentary clamping means of said apparatus and maintaining said apparatus inserted in said support means with said spring element means in its first retracted position; and

holding means mounted to said support means for selectively fixing said spring element means in its first retracted posi-

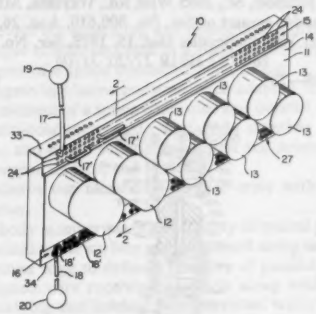
tion, wherein said spring element means will clamp said apparatus in said support means while said holding means will keep said spring element means in said first retracted position, said holding means selectively releasing said spring element means and permitting removal of said apparatus from said support by allowing said received apparatus to move said spring element from its first retracted position to its second extracted position during removal of said apparatus whereby said clamping means disengages said complimentary clamping means on said apparatus when said spring element means is in its extracted position.

4,093,329

MANIFOLDING MEANS AND SYSTEM FOR ELECTRICAL AND/OR PNEUMATIC CONTROL DEVICES AND METHODS

Clarence M. Asbill, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 22, 1977, Ser. No. 780,038
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—16 R **20 Claims**



1. In a manifold means adapted to detachably carry on one side thereof a plurality of pneumatically and electrically operated control units each of which is adapted to be fluidly and electrically interconnected to pneumatic means and electrical means of said manifold means, the improvement wherein said one side of said manifold means has external interconnection means for said pneumatic means and said electrical means whereby external pneumatic and electrical lines can be interconnected to the same side of said manifold means that said units are adapted to be interconnected thereto.

4,093,330

CIRCUIT CHIP RECEPTACLE

Robert B. Pittman, River Edge, N.J., assignor to Industrial Electronic Hardware, New York, N.Y.

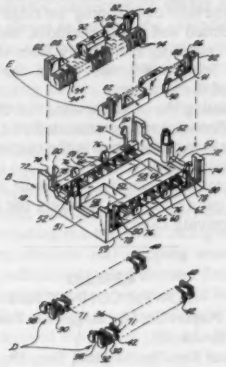
Filed May 16, 1977, Ser. No. 797,015
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **40 Claims**

1. A receptacle for a circuit chip having a plurality of exposed connection pads spaced from one another, comprising:

(A) a support body having opposite faces, a chip-receiving station on one face thereof, and an aperture extending through said body to the other face thereof from said chip-receiving station in the vicinity of said chip-carried connection pads when said chip is at said chip-receiving station;

(B) a contact-holding element removably secured to said body and defining a plurality of spaced contact-receiving first passages in communication with said aperture;

(C) a plurality of contact members adapted to be associated with said receptacle, each of said members having a first contact portion extending at least partially through one of said first passages, a second contact portion extending from said first contact portion to said one body face and there exposed at said chip-receiving station to engage and make electrical connection with a given one of said chip-carried connection pads, and a third contact portion extending from said first contact portion to said other body face and there exposed for the making of an external connection thereto, said contact member having a first stop part engaging said contact-holding element from the direction of said one body face, thereby limiting the degree to which said contact member can move toward said other body face; and



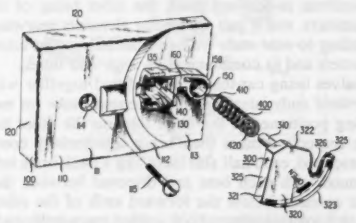
(D) a contact-retaining element removably mounted on said body at said one body face thereof and having second passages in which said second contact portions are received, each of said contact members having a second stop part engaging said contact-retaining element from the direction of said other body face, thereby limiting the degree to which said contact member can move toward said one body face.

4,093,331

CONTAMINANT RESISTANT FEMALE CONNECTOR

Andrew John Molchan, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1977, Ser. No. 796,991
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—39 **4 Claims**



1. A contaminant-resistant female connector comprising:

a housing including:

a front wall,

a plug-receiving cavity that is open to the front wall,

a ridge projecting forwardly from the front wall, the ridge substantially surrounding the opening to the plug-receiving cavity,

a carrier-receiving cavity that is situated adjacent to the plug-receiving cavity, communicates with the plug-

receiving cavity, and is open to the rear of the housing, and

a spindle-receiving cavity that is open to the front wall;

a cover pivotally mounted on the housing and movable between a closed and an open position and having an in-use position intermediate the closed and open positions, the cover including

a front wall overlying the front wall of the housing, the front wall of the cover extending into close proximity with the forward end of the ridge when the cover is in the closed and in-use positions,

a skirt extending rearwardly from the front wall of the cover, the skirt overlapping the ridge when the cover is in the closed and in-use positions, and

a spindle extending rearwardly from the front wall, the spindle being positioned within the spindle-receiving cavity of the housing;

means for biasing the cover toward the closed position;

a plurality of contact springs mounted on a dielectric carrier, the carrier being positioned in the carrier-receiving cavity of the housing; and

means for rotatively securing the spindle within the spindle-receiving cavity and also retaining the carrier within the carrier-receiving cavity.

4,093,332

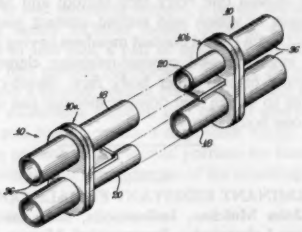
POWER CONNECTOR

Paul S. Simko, Naperville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 426,156, Dec. 19, 1973, which is a continuation of Ser. No. 246,813, Jun. 21, 1972, abandoned. This application Nov. 27, 1974, Ser. No. 527,927

Int. Cl.[2] H01R *25/02*

U.S. Cl. 339—49 R **5 Claims**



1. A connector comprising a pair of identical halves,

each half including a plate-like base member, and a pair of transversely-spaced, elongated tubes extending forwardly therefrom to forward ends, the tubes being of different diameters, and a pair of tubular elements rearwardly extending to rear ends with substantially equal internal diameters and in communication with said tubes,

the halves being capable of being fitted together with their forward ends interfitted and the small tube on each half being positioned in the large tube on the other half, and the respective tubes then being substantially completely telescoped, each half also including a latch hook integrally formed with each base and disposed between the tubes and recessed below the forward ends of the tubes, each latch hook including a hook angled rearwardly and facing the large tube, the latch hooks being interconnected in a releasable locking relation when the halves are fitted together, and each connector half also including contacts with elements extending into but recessed below the tubes and tubular elements, and making mutual contact engagement within respective telescoped tubes, wherein the base member is made up of front and rear base members permanently secured together with the tubes and tubular elements being integral with the front and rear members, respectively,

wherein the tubes communicate with said rear tubular elements through openings of substantially lesser diameter than the internal diameter of the rear tubular elements thereby forming shoulders around those openings on the base member, and said contacts have outer portions of greater diameter than said openings forming shoulders thereon engaging said shoulders on the base member and tubular portions extending rearwardly from said shoulders, and

the rear tubular portions have spring tines biased radially inwardly against said tubular portions, normally retaining the contacts in position, but being capable of being flexed outwardly to release the contacts to enable withdrawal of the contacts out through said rear tubular elements.

4,093,333

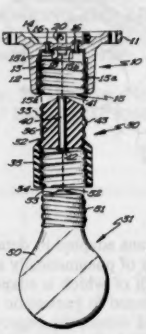
ELECTRICAL ADAPTER

David A. Tjornhom, Sr., 2895 West Rd., Wayzata, Minn. 55391

Continuation-in-part of Ser. No. 500,610, Aug. 26, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,937

Int. Cl.[2] H01R *17/20, 31/06*

U.S. Cl. 339—78 **11 Claims**



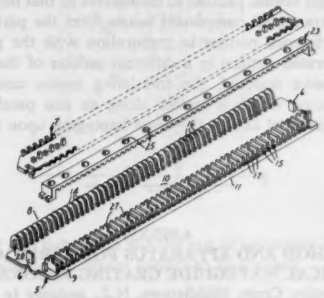
1. An adapter for electrically connecting an electric light socket having an internal threaded electrically conductive portion to a light bulb having an electrically conductive external sleeve provided with external threads, the adapter comprising: a tubular member having a threaded first end section adapted to mate with the threaded electrically conductive portion of the socket and a second end section having an internal threaded wall forming a cavity for accommodating the threaded sleeve of the light bulb, first electrical conductor means extended between the first end section and engageable with a portion of the socket and the second end sections and the socket and sleeve of the bulb, said first section having an externally open groove, said second section having an internally open groove, said first electrical conductor means comprising an elongated electrically conductive member located in said first and second grooves, and second electrically conductive means insulatively mounted on the tubular member adapted to contact the center of the base of the bulb and the center of the socket, and means for locking adapter in a socket, said means for locking the adapter in the socket comprising a band spring located within the tubular member, and locking finger means cooperating with the spring whereby the spring biases the finger locking means to a locking position, said first end section of the tubular member having a hole for accommodating said locking finger means.

4,093,334

WIRE RETAINER

Ralph F. Wickenberg; Donald F. Miller, and Lyle R. Anderson, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 8, 1977, Ser. No. 814,024
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—107 5 Claims



1. A device for separating and positioning individual wires of a multiple conductor cable in a fixed relationship over the base element of a splice connector comprising:

an elongate insulative body member adapted to receive a base element of a splice connector and isolated wires from a multi-conductor cable, said body member having an upper and lower surface and a first and second edge on said upper surface, and

an insulative cap member formed to mate with said body member,

said body member having a plurality of spaced projections on said upper surface and positioned along said first and second edge to define a plurality of parallel transverse aligned wire receiving channels along said edges for receiving and holding said individual wires in substantially parallel alignment,

said body member having a plurality of strain relief recesses formed in said upper surface of said body member and located within said wire channels along said first edge,

said body member and said cap member having a plurality of alignment means for aligning said cap member with said body member,

said cap member having spaced wire pusher means aligned with said access holes to cooperate with said access holes for bending and binding said individual wires at said access holes, and

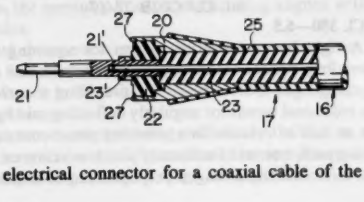
retaining means for securing said cap member on said body member.

4,093,335

ELECTRICAL CONNECTORS FOR COAXIAL CABLES

Oscar H. Schwartz, Brooklyn, and Daniel A. Le Donne, Bronx, both of N.Y., assignors to Automatic Connector, Inc., Commack, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,475
Int. Cl.[2] H01R *17/04*
U.S. Cl. 339—177 E 4 Claims



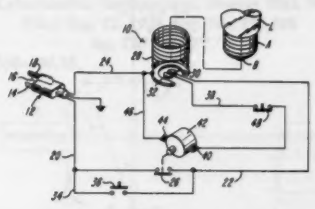
1. An electrical connector for a coaxial cable of the type including a solid tubular dielectric having an inner conductor fitting therethrough and at least an outer tubular conductor covering along said dielectric, said connector comprising a contact wedge assembly, a body assembly and a nut assembly with said contact wedge assembly being pressed fit between said body and nut assemblies as they are connected together, said contact wedge assembly comprising an electrically conductive tapered funnel element for slidably receiving therein the end portion of the tubular dielectric of the cable whereby said tapered element shall lie between said dielectric and the outer tubular conductor of the cable and shall contact said outer tubular conductor, said contact wedge assembly comprising receptacle means to receive the extending bare end of the inner conductor, said nut assembly comprising an aperture to receive the cable and a clamping ferrule, said aperture terminating in said clamping ferrule, said ferrule capable of moving towards the end of the cable when the cable is associated with said tapered funnel element to cooperate with said tapered funnel element to clamp the outer tubular conductor of the cable between said ferrule and said tapered funnel element, said body assembly comprising a body telescoped in a coupling nut, said body comprising thin metal walls surrounding a central dielectric and terminating in a body seat facing said electrically conductive tapered element, and gripping means for holding said electrically conductive tapered element fixed to said body seat to prevent relative rotation between said inner conductor and said electrically conductive tapered element as said electrically conductive tapered element is pressed against said body seat, said gripping means comprising teeth extending oppositely from said taper, said teeth and said electrically conductive tapered element being integrally formed together and being of a metal material harder than the material of said body whereby edges of said teeth will bite into said body seat as said body and tapered element are drawn together.

4,093,336

SAFETY CIRCUIT AND SOCKET CONSTRUCTION

Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440

Divison of Ser. No. 510,215, Sep. 30, 1974, Pat. No. 4,008,403.
This application Feb. 10, 1977, Ser. No. 767,434
Int. Cl.[2] H01R *17/20*
U.S. Cl. 339—180 9 Claims



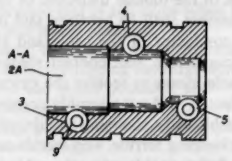
1. In a socket construction of the type having a first contact for engaging one terminal of a load and a second contact for engaging a second terminal of the load, the improvement wherein one of said contacts has two spaced parts, said spaced parts being electrically interconnected by one of said terminals upon insertion of said load in said socket, wherein first conductor means is connected to one of said contact parts for connecting said one of said contact parts to an electrical energy source, and wherein second conductor means is connected to the other of said contact parts for connecting said other of said spaced parts to electric circuit means external to said load.

4,093,337

SOCKET CONTACT

Tord Jacobson, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 19, 1976, Ser. No. 743,508
Int. Cl.[2] H01R 13/12
U.S. Cl. 339—256 S 1 Claim



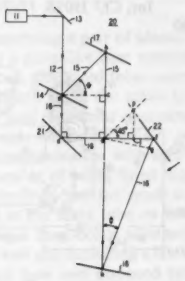
1. In a socket contact with an axial cavity for the reception of a contact element which is provided with an outer contact surface, the socket contact having a helical spring which is part of the conducting path of the socket contact and is arranged to touch the contact surface of the contact element, the improvement comprising means for supporting the helical spring with a straight longitudinal axis which is perpendicular to the longitudinal axis of the axial cavity and partly recessed in the wall of the axial cavity, and partly extending laterally into the axial cavity, said means permitting lateral movement of the helical spring radially outward from the axial cavity by the contact surface of the contact element upon insertion thereof into the axial cavity, said means fixing the helical spring in place by pressure against the ends of the helical spring, and the center of the helical spring having turns with shorter diameters than the turns at the ends of the helical spring.

4,093,338

APPARATUS FOR PIECEWISE GENERATION OF GRATING-LIKE PATTERNS

Gary Carl Bjorklund, West Windsor; Linn Frederick Mollenauer, Colts Necks, and Walter John Tomlinson, III, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 12, 1976, Ser. No. 648,326
Int. Cl.[2] G02B 5/32; G03H 1/04; G01B 9/02
U.S. Cl. 350—3.70 2 Claims



1. Apparatus for piecewise generation of a grating-like pattern in a photoresponsive material, the apparatus comprising:

an interferometer having a plurality of elements wherein a coherent beam of light is split into two component beams which are made to intersect;

a photoresponsive material having a planar surface is positioned normal to the bisector of the angle between the two component beams at their intersection, the component beams forming a parallel plane interference pattern in a section of the photoresponsive material, wherein the difference between optical path lengths of the two component beams intersecting in the photoresponsive material can be adjusted to zero at any one point in the material, and the angle of intersection between the two intersecting component beams can be adjusted by rotation of a single element about a fixed axis, without changing the difference between the optical path lengths of the two component beams; and

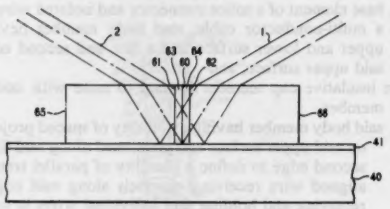
means for translating the coherent beam, and thus the component beams, parallel to themselves so that the intersecting translated component beams form the parallel plane interference pattern in registration with the previously generated pattern in a different section of the photoresponsive material, the translating means comprising a reflector which is moved along an axis parallel to the longitudinal axis of the beam impinging upon the reflector.

4,093,339

METHOD AND APPARATUS FOR FABRICATING OPTICAL WAVEGUIDE GRATING RESONATORS

Peter Stanley Cross, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1977, Ser. No. 800,651
Int. Cl.[2] G02B 5/18, 5/32; G03H 1/04
U.S. Cl. 350—3.70 7 Claims



1. Apparatus for creating an interference pattern in a photoresist layer covering an optical substrate having a waveguiding layer, said apparatus comprising laser means for developing two coherent beams of radiation that are directed so as to create an interference pattern in a predetermined area of said photoresist layer, and at least one sheet of high index medium positioned adjacent to said predetermined area substantially perpendicular to said waveguiding layer and oriented such that only a portion of each of said two beams is caused to pass through said high index sheet before that portion impinges on said photoresist layer, whereby an optical grating resonator can be fabricated in the waveguiding layer of said optical substrate.

4,093,340

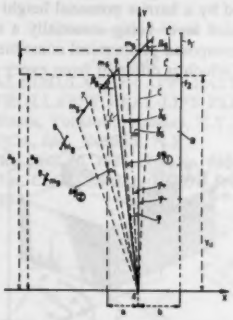
LIGHT-BEAM DEFLECTION SYSTEM

Karl Klose, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 688,064
Claims priority, application Germany, May 30, 1975, 2524152
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—6.5 6 Claims

1. A light beam deflection system for scanning a planar surface along a linear scanning path at a uniform rate of speed, comprising light source means for providing a narrow light beam, rotational means for angularly deflecting said light beam about an axis of rotation in a scanning plane containing said scanning path, a series of stationary planar mirrors, each of said planar mirrors being arranged perpendicular to said deflecting

path and tangential to a parabola defined in said deflection plane so that the focal point thereof coincides with the axis of



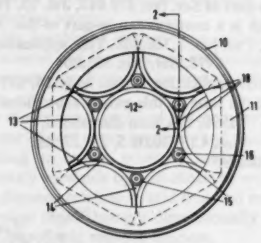
rotation of said light beam and the axis of symmetry thereof is perpendicular to the planar surface to be scanned.

4,093,341

OPTICAL FIBER CONNECTOR

Aubrey M. Crick, Epping, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 685,115
Claims priority, application United Kingdom, Jun. 19, 1975, 26105/75
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 4 Claims



1. An optical fiber multi-way connector member comprising:

a rigid shell having an elastomeric lining therein;

means comprising a plurality of aligned rods in said shell having cylindrical surfaces dimensioned to provide a plurality of tricuspid interstices that are each defined by the meeting together of three of said cylindrical surfaces;

a plurality of optical fibers each secured inside a ferrule to terminate at one end thereof the fiber axis aligned with the ferrule axis;

said ferrules being located in said tricuspid interstices in which they each have an interference fit;

an apertured member secured to said shell behind said ferrules, the apertures in said member being aligned with said ferrules;

a helical spring surrounding the fiber protruding from each said ferrule and acting between said apertured member and ferrule to bias said ferrule forwardly into its associated interstice; and

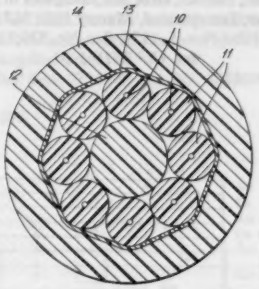
said apertured member being sufficiently resilient to allow the insertion and withdrawal of the ferrules and their corresponding springs through its apertures.

4,093,342

OPTICAL FIBER CABLE

Stanley G. Foord, Harlow, and Walter E. Simpson, Ware, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 626,073, Oct. 28, 1975, abandoned.
This application Nov. 17, 1976, Ser. No. 742,676
Claims priority, application United Kingdom, Nov. 12, 1974, 48859/74
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.23 1 Claim



1. An optical fiber cable comprising:

a plurality of optical fibers disposed lengthwise around a high elastic modulus strength reinforcement member extending along the neutral axis of the cable;

said reinforcement member consisting of a prestretched molecularly oriented plastic;

a plastic tape wrapped about said fibers on said reinforcement member;

an extruded plastic sheath surrounding said tape on said reinforcement member; and

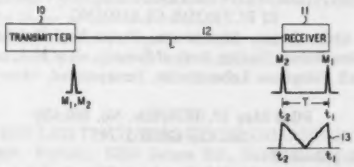
said plastic tape being of a material different than said sheath and being contiguous with said sheath, said plastic tape providing a heat shield for said reinforcement member so that shrinkage of said reinforcement member will not occur during extrusion of said plastic sheath.

4,093,343

OPTICAL WAVEGUIDE HAVING PERIODIC SPATIAL PERTURBATIONS

Logan Ezral Hargrove, Arlington, Va., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 22, 1976, Ser. No. 725,388
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.30 15 Claims



1. In a multimode waveguide capable of guiding wave energy at a frequency of interest in a plurality of different propagating modes, and of dissipating wave energy in the form of radiating modes, means, longitudinally distributed along said waveguide, for enhancing the coupling between selected pairs of propagating modes;

characterized in that:

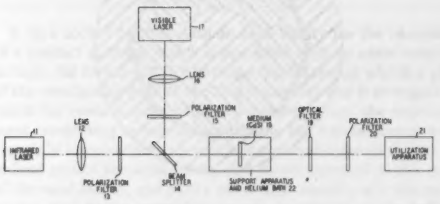
the spatial frequency of said coupling-enhancing means

varies between a first frequency f_1 and a second frequency f_2, where f_1 and f_2 are the spatial frequencies corresponding, respectively, to the beat frequency between the two lowest order propagating modes, and the two highest order propagating modes.

4,093,344
INFRARED POLARIZATION ROTATOR AND OPTICAL SWITCH

Theodoor Charlouis Damen, Colts Neck; Erich Gornik, Red Bank; Van-Tran Nguyen, Holmdel, and Chandra Kumar Naranbhai Patel, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 5, 1976, Ser. No. 739,320
Int. Cl.² B01F *1/01*
U.S. Cl. 350—147 **14 Claims**



1. An infrared polarization rotator comprising a medium, means for applying to said medium a linearly polarized beam of light to be polarization rotated, means for applying to said medium substantially collinearly with said beam a control beam of circularly polarized light, the frequencies of the beams being adjusted so that the frequency of one beam is nearly equal to the frequency of a one-photon transition between the ground state of a two-photon transition of the medium and some intermediate state and so that the sum of the frequencies of the two beams is sufficiently close to the frequency of said two-photon transition for substantial resonance dispersion to be produced as the beams traverse the medium, the polarization of the beams being selected in accordance with the requirements of the quantum-mechanical angular momentum selection rule which applies to said two-photon transition, characterized in that said medium is a crystalline solid the index of refraction of which does not substantially vary azimuthally about the direction of propagation of the radiation to be polarization rotated, said crystal having a structure of excited states of excitons, which exciton states are involved in said one-photon and two-photon transitions.

4,093,345
SEMICONDUCTOR RIB WAVEGUIDE OPTICAL MODULATOR WITH HETEROJUNCTION CONTROL ELECTRODE CLADDING

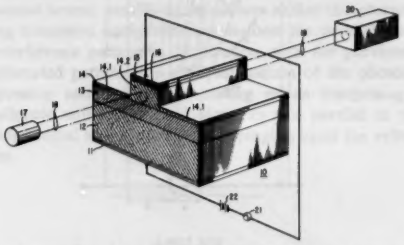
Ralph Andre Logan, Morristown; Franz Karl Reinhart, and William Robert Sinclair, both of Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 27, 1976, Ser. No. 690,650
Int. Cl.² G02B *5/14*
U.S. Cl. 350—355 **19 Claims**

1. In a semiconductor device for modulating optical radiation in response to an electrical signal

(a) a first epitaxial semiconductor layer in direct physical contact with a second epitaxial semiconductor layer of the same conductivity type as that of the first epitaxial layer and of higher bulk refractive index than that of the first epitaxial layer, said second epitaxial layer having a relatively thick optical rib waveguide portion and a relatively thin slab portion, said rib waveguide portion having a major plateau surface;

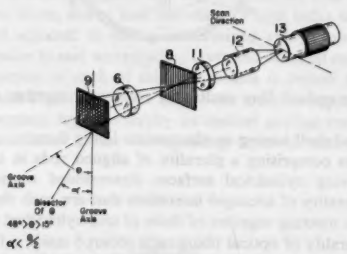
(b) a third layer contacting at least a first portion of the plateau surface of the rib waveguide portion, said third layer thereby forming a heterojunction with the rib portion of the second epitaxial layer, said heterojunction characterized by a barrier potential height of at least 0.3 volt, said third layer being essentially a semiconductor compound composed of chemical constituent elements at least one of which is different from every chemical constituent element of the semiconductor material of the first and second epitaxial layers, and said third layer being essentially a polycrystalline material having a bulk refractive index for said optical radiation that is less than that of the second epitaxial layer and having a free carrier concentration that is at least an order of magnitude higher than those of the first and second epitaxial layers.



4,093,346
OPTICAL LOW PASS FILTER

Hisashi Nishino; Teruo Hosokawa, both of Sakai, and Ikuo Hioki, Kishiwada, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Continuation-in-part of Ser. No. 379,013, Jul. 13, 1973, Pat. No. 3,910,683, which is a continuation-in-part of Ser. No. 164,757, Jul. 21, 1971, Pat. No. 3,768,888. This application May 27, 1975, Ser. No. 581,004
Claims priority, application Japan, May 24, 1974, 58649[U]
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.² G02B *5/18, 27/38*
U.S. Cl. 350—162 SF **20 Claims**



1. A color television camera including an optical system of the type having a color-encoding filter means disposed in the light path of said optical system and serving to spatially modulate at least two color images with respect to a scanning direction and scanning means for detecting said image and producing chrominance and luminance signals,

the optical system comprising optical low-pass filter means including a transparent substrate and at least two sets of channels formed on said substrate and delineating raised portions for introducing phase retardation,

the channels in each set being arranged in parallel with each other and disposed at an angle of not less than 15° and not more than 45° to the channels of at least one other set, the

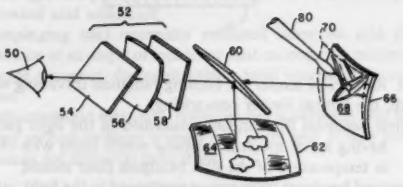
angle between a line bisecting the acute angle formed between said sets of channels and the perpendicular to said scanning direction being no greater than half said acute angle.

4,093,347

OPTICAL SIMULATION APPARATUS USING CONTROLLABLE REAL-LIFE ELEMENT

Joseph A. La Russa, Yorktown Heights, N.Y., assignor to Farrand Optical Co., Inc., Valhalla, N.Y.

Filed May 10, 1976, Ser. No. 685,017
Int. Cl.[2] G02B 27/10; G09B 9/08
U.S. Cl. 350—174 6 Claims



1. Optical simulation apparatus for training an observer in the manipulation of a controllable real-life element relative to at least one real-life image, said apparatus comprising:

(a) optical means for forming an image at or near infinity for stereoscopic viewing by said observer;

(b) a first display screen and means for generating a first display of a simulated real-life image on said first display screen;

(c) a second display screen and means for generating a second dislay of another simulated real-life image on said second display screen;

(d) means for combining images from said first and second display screens and for directing said images toward said optical means for forming an image viewable by said observer; and

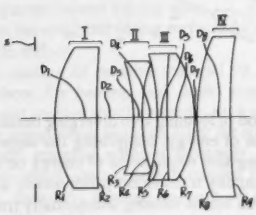
(e) a three-dimensional physical object positioned between at least one of said display screens and said optical means for forming an image, whereby said physical object is itself directly viewable by said observer with parallax and relative distance relative to said first and second displays, said physical object being a dimensionally smaller model of said controllable real-life element.

4,093,348

LENS SYSTEM WITH FRONTAL APERTURE STOP

Mitsuo Yasukuni, Sakai, Japan, assignor to Minolta, Torrance, Calif.

Filed May 25, 1976, Ser. No. 689,851
Claims priority, application Japan, Jun. 3, 1975, 50/67325
Int. Cl.[2] G02B 9/34
U.S. Cl. 350—206 13 Claims



1. A frontal aperture lens system consisting, consecutively from the object to the image side, of:

an aperture stop,

a first positive lens component having a front surface convex to the object side,

a second biconcave lens component,

a third positive meniscus lens component convex to the image side, and

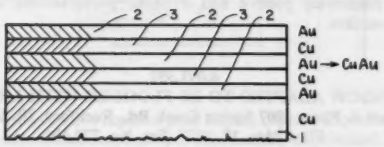
a fourth positive lens component having a front surface convex to the object side, characterized in that the third positive meniscus lens component is a doublet consisting of a negative lens and a positive lens which is cemented to the negative lens at the image side thereof.

4,093,349

HIGH REFLECTIVITY LASER MIRRORS

George J. Mills, Santa Ana, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 27, 1976, Ser. No. 736,157
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—288 15 Claims



1. A highly reflective laser mirror having high thermal conductivity comprising:

a. a polished copper substrate, and

b. a layer of copper-gold alloy which has been heat-treated and quenched to transform said layer into a face-centered cubic lattice structure in which the copper and gold atoms are ordered in certain lattice positions.

4,093,350

SYSTEM FOR CENTRIFUGALLY CASTING A THIN FILM PLASTIC IN A REPLICA PROCESS FOR PROVIDING MULTI-FACETED POLYGONAL SCANNERS

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1976, Ser. No. 687,720
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—299 7 Claims

1. A process of providing high speed multi-faceted polygonal scanners comprising providing a polygonal master the inner periphery of which comprises a plurality of facet shaped members, providing an aluminum preform positioned concentrically within said master, and centrifugally casting an epoxy against said aluminum preform in a replica process to provide a multi-faceted polygonal scanner said casted epoxy conforming to the shape of said faceted master.

7. A multi-faceted polygonal scanner produced in accordance with the process as defined in claim 1.

4,093,351

CONTROLLED FLEXIBLE MEMBRANE REFLECTOR

Charles W. Perkins, 5256 James Rd., Santa Barbara, Calif. 93111, and Gerhard Rohringer, 745 Winding Creek La., Santa Barbara, Calif. 93108

Filed Mar. 15, 1976, Ser. No. 667,169
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—310 13 Claims

1. A controlled flexible membrane reflector comprising:

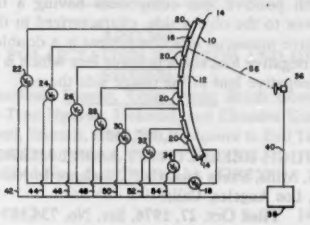
a flexible conductive membrane with an optical surface;

a supporting structure on which said membrane is mounted;

means for providing an electric field operative on said flexible membrane, said optical surface of said flexible conductive membrane being shaped by said electric field;

a sensor for continuously detecting the shape of said optical surface of said flexible membrane; and

means responsive to said sensor for controlling selected



portions of said electric field for altering the shape of corresponding selected portions of said optical surface to counteract passive and dynamic perturbations in said surface.

4,093,352

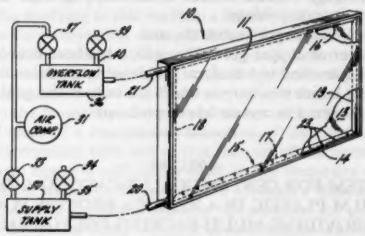
WINDOW ADAPTED TO BE FLOODED WITH LIQUID

Robert J. Pisar, 2807 Spring Creek Rd., Rockford, Ill. 61107

Filed Mar. 17, 1977, Ser. No. 778,496

Int. Cl.² G02B *5/24*

U.S. Cl. 350—312 **5 Claims**



2. A window comprising a pair of upright panes made of transparent material and disposed in spaced face-to-face relation whereby a space is defined between said panes, means extending around said panes and establishing a liquid-tight seal around said space, a liquid supply manifold disposed within said space, said manifold comprising upper and lower tubular branches disposed adjacent the top and bottom portions, respectively, of said space and further comprising an upright tubular branch disposed adjacent one side portion of said space and establishing communication between said upper and lower branches, liquid inlet means opening out of said lower branch and communicating with said space, gas outlet means in the upper end portion of said upright branch and establishing communication between said space and said upright branch, a supply reservoir containing liquid and communicating with said lower branch, an overflow reservoir communicating with said upper branch, selectively operable means for delivering liquid from said supply reservoir to said manifold with said liquid flowing into said space by way of said inlet means and flowing to said upper branch and thence to said overflow reservoir by way of said upright branch, the gas in said space being expelled therefrom through said outlet means and said upper branch as liquid enters said space through said inlet means, and selectively operable means for causing liquid to be returned from said overflow reservoir and said space to said supply reservoir, the liquid from said overflow reservoir flowing into said upper branch and then through said side branch to said lower branch and then flowing to said supply reservoir, the liquid in said space returning to said lower branch by way of said inlet means and then flowing to said supply reservoir.

4,093,353

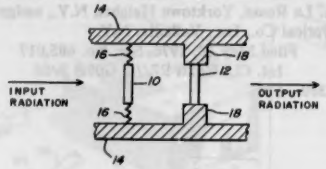
OPTICAL RADIATION LIMITER

Kenneth T. Lang, Dover, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 17, 1976, Ser. No. 751,836

Int. Cl.² G02B *5/22*

U.S. Cl. 350—313 **2 Claims**



1. An optical limiter for limiting radiation travelling along a path, the optical limiter comprising:

first bandpass filter means positioned in the light path and having a first spectral passband which shifts with changes in temperature of the first bandpass filter means;

second bandpass filter means positioned in the light path and having a second spectral passband, the first and second spectral passbands at least partially overlapping when the radiation travelling along the path has an intensity less than a threshold level; and

thermal isolation means for thermally isolating the first bandpass filter means to an extent greater than the second bandpass filter means, whereby radiation travelling along the path having intensity greater than the threshold level causes a shift of the first spectral passband with respect to the second spectral passband.

4,093,354

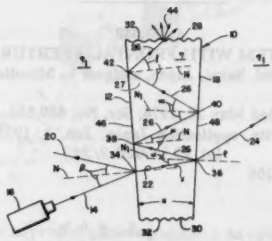
METHOD AND APPARATUS FOR SPLITTING A BEAM OF ENERGY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Walter Robert Leeb, Seabrook, Md.

Filed Dec. 23, 1975, Ser. No. 643,897

Int. Cl.² G02B *27/17, 5/04*

U.S. Cl. 350—320 **13 Claims**



1. A method of forming two diverging beams of energy from a single beam of energy, comprising the steps of:

a. impinging said single beam of energy on a first surface of a substantially transparent prism means, a cross-section of said prism means forming substantially truncated isosceles triangle sides, said cross-section being taken perpendicular to said sides, said sides having a base forming a wide end of said prism means, said prism means having an index of refraction substantially greater than a surrounding me-

dium, and said single beam of energy being angled at said first surface toward said wide end of said prism means;

b. splitting said single beam of energy into an externally reflected beam and an internally transmitted beam at said first surface, said internally transmitted beam traveling through said prism means toward a second surface angled toward said wide end;

c. impinging said internally transmitted beam on said second surface at an angle of incidence that is less than the minimum angle necessary for substantially total internal reflection;

d. splitting said internally transmitted beam into an internally reflected beam and an externally transmitted beam at said second surface, said internally reflected beam traveling through said prism means toward said first surface angled toward said wide end;

e. impinging said internally reflected beam on said first surface at an angle of incidence that exceeds the minimum angle necessary for substantially total internal reflection; and

f. reflecting said internally reflected beam between said first and second surfaces toward said wide end of said prism means for dispersal therefrom.

4,093,355

SYMMETRICAL INTERNAL HEATER FOR LIQUID CRYSTAL DISPLAY

Michael Kaplit, Birmingham; Daniel B. Hayden, Port Huron, and George W. Smith, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1977, Ser. No. 765,548
Int. Cl.² G02F 1/13
U.S. Cl. 350—334 **6 Claims**

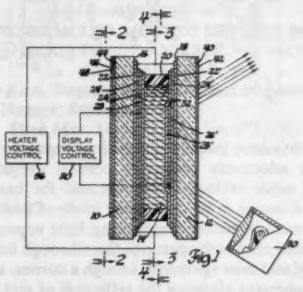


Fig. 1

1. A liquid crystal cell having a resistive-type internal heater for rapid warm-up of the liquid crystal cell and for use while the cell is functioning as an electro-optic visual display, said cell comprising:

first and second members having spaced apart facing surfaces in a visual display area, at least one of said members being transparent in said display area;

a liquid crystal between said facing surfaces for exhibiting an electro-optic efffect;

a transparent coating of resistive material on each of said facing surfaces for heating said liquid crystal material from two heat sources simultaneously, each coating being electrically symmetrical with the other for so heating said liquid crystal material without adversely affecting an electro-optic effect concurrently produced therein;

a transparent dielectric coating on each of said resistive material coatings; and

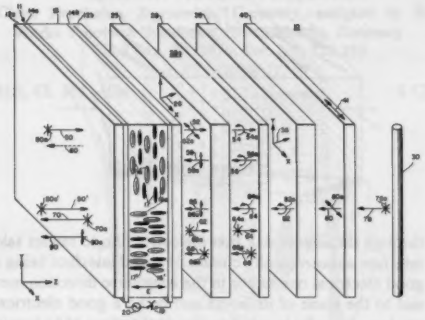
a transparent electrode on each of said dielectric coatings for producing an electro-optic effect in said liquid crystal material.

4,093,356

TRANSFLECTIVE LIQUID CRYSTAL DISPLAY

John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,105
Int. Cl.² G02F 1/13
U.S. Cl. 350—338 **6 Claims**



1. A transflective liquid crystal display capable of producing observable indicia responsive to substantially unpolarized light entering from the front or the rear of the display, comprises:

a liquid crystal cell switchable between first and second light transmissive conditions, the first transmissive condition causing substantial absorption of light having a polarization vector in a first direction, the second condition allowing transmission of light through said cell with substantially no attenuation thereof;

a first quarter-wave plate adjacent the rear of said cell and having an optical axis positioned substantially at a 45° angle with respect to said first direction;

a transflective member arranged adjacent said first quarter wave-plate and opposite said cell;

a second quarter-wave plate arranged upon the opposite side of said transflective member from said first quarter-wave plate, said second quarter-wave plate having an optical axis disposed essentially parallel to the optical axis of said first quarter-wave plate; and

means positioned adjacent said second quarter-wave plate opposite said transflective member for polarizing substantially unpolarized light in said first direction.

4,093,357

CERMET INTERFACE FOR ELECTRO-OPTICAL DEVICES

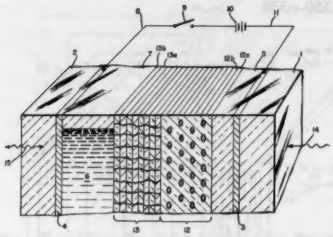
Alexander D. Jacobson, Topanga; Jan Grinberg; Paul O. Braatz, both of Los Angeles, and William P. Bleha, Jr., Carlsbad, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 5, 1977, Ser. No. 784,894
Int. Cl.² G02F 1/13
U.S. Cl. 350—338 **5 Claims**

1. In an electro-optical device of the type having substrate means for providing spatially and temporally modulated voltage or current patterns, having electro-optical means for presenting a display controlled by said patterns, and having an interface comprising light blocking means and mirror means between said substrate means and said electro-optical display means, the improvement comprising:

said light blocking means comprising a plurality of layers each formed by a pair of sequentially alternating films, the first of said films in each of said pairs comprising a homogeneous dielectric material and the second of said films in each of said pairs comprising a randomly dispersed plurality of islands of a metallic electrical conductor separated by said dielectric material, said islands being spaced suffi-

ciently to minimize the lateral conductivity of said second films and said first dielectric films being thin enough to permit transverse conduction between metal islands in said second films of adjacent layers by electron tunneling



through the intervening first dielectric film to render said interface anisotropically conductive, said interface being a good electrical conductor in the transverse direction normal to the plane of its layers and being a good electrical insulator laterally in any direction in the plane of its layers.

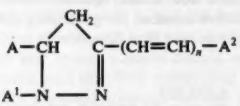
4,093,358

HIGH EFFICIENCY ELECTROCHROMIC DISPLAY DEVICE

Meredith David Shattuck, and Glenn Tavernia Sincerbox, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,303
Int. Cl.[2] G02F *1/17, 1/23;* C09K *3/00*
U.S. Cl. 350—357 **8 Claims**

1. In a reversible electrochromic display device comprising a reactive medium between two electrically conductive electrodes, at least one of which is transparent, said medium comprising an anhydrous solvent and an oxidant/reductant pair wherein the reductant is an electron acceptor, the improvement according to which the oxidant is a triaryl pyrazoline compound having the formula:



wherein A, A^1 and A^2 are each phenyl or phenyl substituted with an electron releasing group, and *n* is zero or one.

4,093,359

OCULAR FIXATION AID

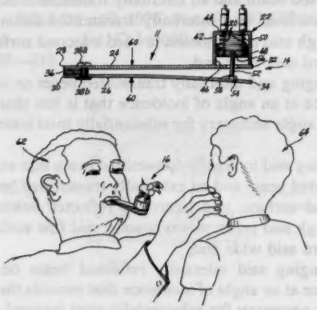
Ferris F. Ketcham, 4615 35th Ave., SW., Seattle, Wash. 98126

Filed Sep. 23, 1976, Ser. No. 725,968
Int. Cl.[2] A61B *3/00, 3/02*
U.S. Cl. 351—1 **5 Claims**

1. An orally held ocular fixation aid for use during the examination of a patient's eyes comprising:

animatable means for providing a fixation target that is effective when animated to attract and maintain the gaze of a patient and to stimulate accommodation;

a support means having a first end and a second end, said first end being sized and shaped for being held in the mouth of a person conducting the examination and for being gripped between such person's teeth, said second end projecting from the mouth of such person when the first end is so held, said animatable means being mounted on said support means adjacent said second end; and



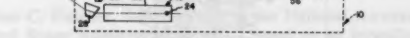
means associated with said support means for animating said animatable means in response to a change in pressure of the grip exerted by the teeth of such person.

4,093,360

OPHTHALMIC INSTRUMENT OPTICAL SYSTEM

Richard C. Mohrman, and Richard L. Seidenberg, both of Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,952
Int. Cl.[2] A61B *3/10*
U.S. Cl. 351—13 **3 Claims**



1. An ophthalmic instrument which utilizes a single imaging system for selectively measuring corneal curvature in the measuring mode of said instrument and for examining the surface of a cornea in the examining mode of said instrument, said instrument including a measuring light apparatus having an illuminated mire with apertures therethrough for projecting an image of said mire apertures through a cornea, said measuring light apparatus allowing the reflection of said mire image formed within the eye to pass through its center, said measuring light apparatus being disposed on an aligning axis about which said instrument may be rotated in order to align said instrument with the principal vertical and horizontal meridians of the eye in the measuring mode of said instrument, and a viewing light apparatus for projecting an image of the cornea along said aligning axis in the examining mode of said instrument, said instrument comprising:

(a) reflecting means for displacing an image from said aligning axis to an imaging system axis and for returning said image to said aligning axis in an erect and unreversed position in order to provide both mire and corneal images in vertical and horizontal alignment with the cornea itself;

(b) imaging system means disposed on said imaging system axis including objective lens means and optical wedge means for measuring the cornea in said measuring mode of said instrument and for examining the cornea in said examining mode of said instrument;

(c) said optical wedge means including a first optical wedge having a first optical axis and a second optical wedge having a second optical axis; and

(d) an eyepiece disposed on said aligning axis at the opposite

end of said instrument from said measuring light apparatus for viewing said images.

4,093,361

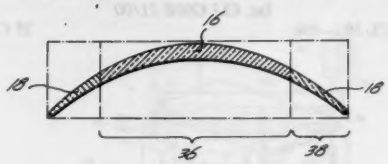
COMPOSITE PROSTHETIC POLYMERIC DEVICES

Charles E. Erickson, and Amar N. Neogi, both of Seattle, Wash., assignors to Precision Cosmet Co., Inc., Minneapolis, Minn.

Continuation of Ser. No. 198,544, Nov. 15, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 464,734

Int. Cl.[2] G02C 7/04

U.S. Cl. 351—160 8 Claims



1. A contact lens comprising a center lens portion and a peripheral skirt portion attached thereto, said center lens portion having a greater hardness than said peripheral skirt portion, said peripheral skirt portion comprising a hydrophilic, normally water swellable, polymer matrix compatible with the material forming said center lens portion, said peripheral skirt portion being relatively free of stress and distortion and containing a water soluble solid inert substance dissolved throughout the polymer matrix before hydration; said substance being removed from said matrix during hydration of said hydrophilic polymer.

4,093,362

PINCH ROLLER MOVING DEVICES FOR SIMULTANEOUS IMAGE AND SOUND RECORDING CINECAMERAS

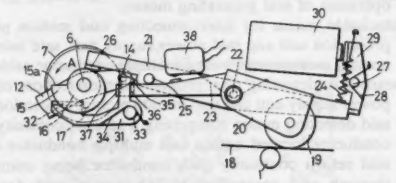
Masakathu Kato, Nagoya, Japan, assignor to Elmo Company, Limited, Nagoya, Japan

Filed Mar. 14, 1977, Ser. No. 777,078

Claims priority, application Japan, Mar. 15, 1976, 51/031373[U]

Int. Cl.[2] G03B 31/02

U.S. Cl. 352—27 13 Claims



1. A pinch roller moving device for a simultaneous image and sound recording cinecamera having a capstan, a pinch roller movable into contact with said capstan to advance continuously a film having a sound recording track along one longitudinal edge thereof, means for driving said film intermittently, an electric motor for driving said capstan and an electric motor for driving said intermittent film driving means, said device comprising:

a rotatable lever on which said pinch roller is rotatably and transversely movably supported;

rotary means rotatable upon rotation of said capstan driving motor; and

means for transmitting said rotation of said capstan driving motor to said rotary means to rotate said lever to move said pinch roller transversely to press said film against said capstan;

said capstan driving motor being actuatable upon depression of a cinecamera release button.

4,093,363

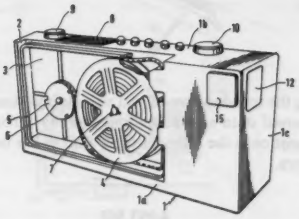
MOTION PICTURE PROJECTOR

Claus Prochnow, Brunswick, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Sep. 30, 1976, Ser. No. 728,210

Int. Cl.[2] G03B 21/10

U.S. Cl. 352—104 8 Claims



1. A motion picture projector comprising a housing having a plurality of walls including a relatively narrow side wall, a relatively wide side wall, and an end wall, said projector being arranged for standing in either of two orientations wherein said wide side wall forms a top surface in a first orientation and said narrow side wall forms a top surface in a second orientation, control elements for said projector being mounted on said narrow side wall to face forward in said first orientation and upward in said second orientation, film spool means arranged on said wide side wall to rotate in a plane parallel with said wide side wall, a projection lens within said housing, said projection lens having an optical axis, a first mirror mounted for swinging movement between a first effective reflecting position intercepting a beam of light rays projected from said projection lens when said projector is in said first orientation and a second ineffective position out of said beam when said projector is in said second orientation, a first light aperture in said wide side wall of said housing in position to receive light reflected by said first mirror when in said first position with said projector in said first orientation, a second mirror mounted on said wide side wall adjacent said first light aperture in position to receive light reflected by said first mirror through said first aperture to said second mirror and to reflect such light in a direction approximately perpendicular to the direction of said optical axis of said projection lens and toward the plane of said narrow side wall on which said control elements are mounted, and a second light aperture in said end wall of said housing in alignment with said optical axis in position to have said beam of light from said projection lens pass along said optical axis and out of the housing through said second aperture when said first mirror is in its second ineffective position and said projector is in said second orientation.

4,093,364

DUAL PATH PHOTOGRAPHIC CAMERA FOR USE IN MOTOR VEHICLES

Keith G. Miller, 88 Carroll St., Binghamton, N.Y. 13902

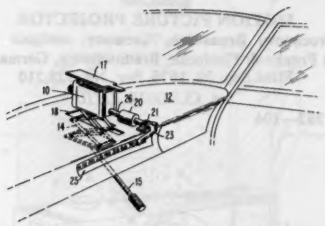
Filed Feb. 4, 1977, Ser. No. 765,841

Int. Cl.[2] G03B 29/00

U.S. Cl. 352—132 4 Claims

1. A photographic recording arrangment for vehicles, including a camera extendably mounted on the dashboard thereof and faced in the direction of travel of said vehicle, said camera having a frontal lens element and a rear lens element for focusing an image of the subject in front of the camera onto the image plane thereof, and a light-splitting prism between

said lenses for focusing an object from a secondary path onto said rear element, said secondary path including an image gathering element comprising a tubular extension of light reflecting mirrors and a lens, said extension being adjustable



for facing the speedometer of said vehicle and thus directing an image thereof onto said prism and thereby through said rear lens element onto the light-sensitive film in the image plane of said camera.

4,093,365

AUTOMATIC FOCUS ADJUSTING DEVICE

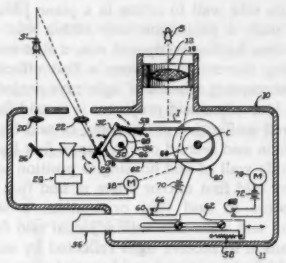
Tadao Isono, Kokubunji, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Mar. 28, 1977, Ser. No. 782,106

Claims priority, application Japan, Mar. 30, 1976, 51-38477[U]

Int. Cl.² G03B *3/00, 7/08*

U.S. Cl. 352—140 14 Claims



1. In a motion picture camera for transporting sound and silent film, the camera having an operation control means, a film transport drive at a film exposure station energizably responsive to the operation control member, a sound station including a capstan selectively powered by a capstan drive, a focusable objective lens for imaging a remote subject onto an image plane at the film exposure station, and an improved automatic focus adjusting system for focusing said objective lens, and having a fixed sensor, an oscillatable sensor for imaging the remote subject on detector means of the adjusting system, and means responsive to the detector for adjusting the focus of said objective lens relative to camera-to-subject distance, the improvement comprising:

circuitry for energizing selectively the capstan drive motor responsive to first switch means associated with said camera operation control member and second switch means responsive to detecting whether silent film or sound film is in the camera;

means connecting said capstan drive to power said oscillatable sensor; and

focus mode selection means associated with said first and second switch means for energizing said capstan drive to power said oscillatable sensor independently of energization of said film transport drive,

whereby said objective lens can be adjusted into focus on a remote subject before film is transported through said exposure station of said camera.

4,093,366

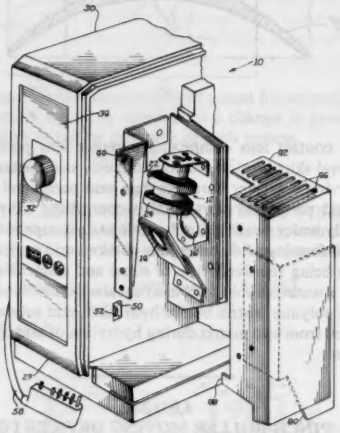
MOTION PICTURE PROJECTOR APPARATUS AND HIGH INTENSITY PROJECTION ARRANGEMENT

Kenyon A. Hapke, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 14, 1977, Ser. No. 777,494

Int. Cl.² G03B *21/00*

U.S. Cl. 352—198 25 Claims



1. Motion picture projection apparatus comprising:

a motion picture projection unit having a high intensity light source, film transporting apparatus and switch means for controlling the operation of said motion picture projection unit;

a power supply unit adapted to be connected to an AC supply source, said power supply unit comprising means for generating the operating supply requirements for said high intensity light source and means for enabling the operation of said generating means;

detachable means for interconnecting said motion picture projection unit and said power supply unit, said interconnecting means comprising a multiple conductor cable; and

means for detecting the proper interconnection of said power supply unit and said motion picture projection unit, said detecting means comprising a return continuity path conductor located within said multiple conductor cable, said return continuity path conductor being connected through said controlling switch means, said detecting means being effective to control said enabling means.

4,093,367

IMAGING APPARATUS

Roger H. Eichorn, deceased, late of Webster, N.Y.; by Lincoln First Bank of Rochester, executor, Rochester, N.Y., and Morton Silverberg, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,237

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R 34 Claims

1. An imaging apparatus employing a transparent electrically photosensitive web member comprising:

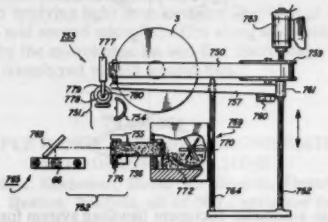
(a) an elongate platen for supporting a receiving medium;

(b) means to suspend the photosensitive member in a plane

substantially parallel to the axis of said platen, and to transport the photosensitive member through the various process means set forth below;

(c) charging means for placing a substantially uniform charge upon the side of the electrically photosensitive member closest to the platen;

(d) exposure means for imagewise exposing the electrically photosensitive member on the side opposite the charged side and creating an electrostatic latent image on the charged side, said exposure means further including a movable exposure head mounted for translation along a path parallel to the axis of said platen and means to advance said exposure head;



(e) development means for depositing marking material on the electrostatic latent image on the electrically photosensitive member;

(f) transfer station means for transferring the marking material image a line-at-a-time by heat and pressure to the receiving medium on said platen; and

(g) first control means for controlling and coordinating the operation of said means to suspend and transport, said various process means set forth above, and said means to advance said exposure head, whereby an image is created, developed and transferred to a predetermined position on the receiving medium.

4,093,368

ELECTROGRAPHIC APPARATUS

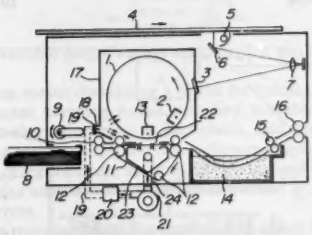
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 23, 1976, Ser. No. 744,267

Claims priority, application Japan, Nov. 27, 1975, 50-141114

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 SC **6 Claims**



1. In an electrographic apparatus comprising a drum type screen photosensitive body and for producing, on a record medium having a dielectric material layer, an electrostatic charge image corresponding to an image to be recorded in response to an electrostatic latent image formed on the screen photosensitive body by controlling a flow of corona ions directed from a corona discharge device through said screen photosensitive body toward the record medium, the improvement comprising: a casing for substantially hermetically surrounding said drum type screen photosensitive body, an air circulating device for circulating a flow of air through said casing, an air circulating path extending from said casing to said air circulating device, and suction means disposed in said air circulating path to secure said record medium firmly in position thereby maintaining a predetermined distance between said record medium and said screen photosensitive body.

4,093,369

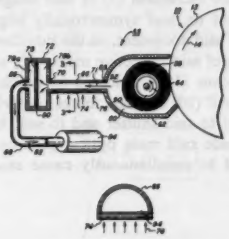
CLEANING SYSTEM

Robert E. Hewitt, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 778,905

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **10 Claims**



1. An apparatus for removing and collecting particles from a surface, including:

means for dislodging the particles from the surface;

means for storing the dislodged particles;

a particle tight conduit operatively connected to said dislodging means for conducting the dislodged particles from said dislodging means to said storing means;

means for moving the dislodged particles from said dislodging means through said conduit to said storing means; and

means for maintaining the dislodged particles spaced from the interior surface of the walls of said conduit the movement of the dislodged particles therethrough.

4,093,370

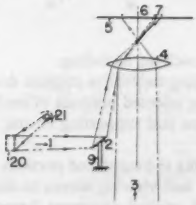
INDICIA RECORDING DEVICE

Roger A. Frech, Canoga Park, Calif., assignor to Terminal Data Corporation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 589,292, Jun. 23, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,761

Int. Cl.² G03B *27/52, 27/70*

U.S. Cl. 355—43 **9 Claims**



1. A compound optical system apparatus, comprising;

(a) a main optical path (3), having,

(1) an image-receiving surface (5,8),

(2) an objective lens (4) for forming an image of a document (10) over a major increment (6) of the area of said image-receiving surface, and

(3) a shutter (26) in said main optical path adjacent to said document,

(b) an auxiliary object (20, 16) comprised of a line of indicia,

(c) an auxiliary optical path (1), having at least one quasi-collimative reflective means (2) small in area with respect to said major increment of area (6) and not greater than the area of said line of indicia, and a length substantially equal to the length of said main optical path,

(d) mounting means (9, 29) to position one said quasi-collimative reflective means (2) in close peripheral relation to, and spaced from, said objective lens (4) on the document side thereof, to cause said auxiliary optical path between said auxiliary object and said reflective means (2) to lie at an angle to the direction of said main optical path, and such as to alter the direction of said auxiliary optical path to lie approximately parallel to the direction of, and closely adjacent to said main optical path, through said objective lens near the periphery thereof and to impinge upon a minor increment (7) of said image-receiving surface adjacent to, and symmetrically aligned with, said image (6) of said document, on the side thereof opposite to the position of said reflective means (2), and

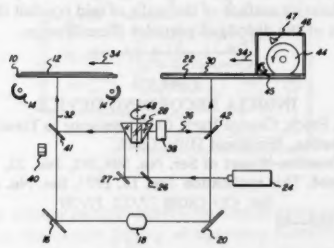
(e) control means (36) connected to synchronously move said document (10) and said image-receiving surface (8), and connected to said shutter and to said indicia, to alternately occlude said main optical path by means of said shutter, and to simultaneously cause said indicia to be illuminated.

4,093,371

COMPOSING MACHINE

Thomas P. Agliata, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 22, 1976, Ser. No. 725,899
Int. Cl.² G03B *27/52, 27/70*
U.S. Cl. 355—43 **7 Claims**



1. A composing machine, including:

means for supporting successive original documents;

means for masking selected portions of each original document disposed on said supporting means;

a viewing screen;

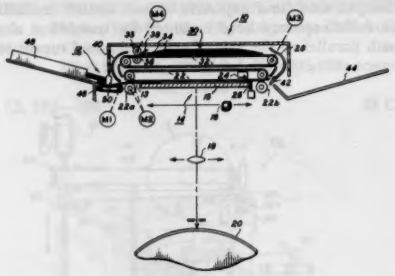
means for projecting the unmasked portions of each original document onto said viewing screen to display successive portions of each original document thereon, said projecting means comprises a light source for illuminating each original document disposed on said supporting means, a lens, first means for directing the light rays reflected from successive masked original documents through said lens forming a light image of the unmasked portion of each original document, and second means for directing the light image of the unmasked portion of each original document onto said viewing screen to be displayed thereon; and means for reproducing the portions of each original document being displayed on said viewing screen.

4,093,372

PRE-SEPARATED RECIRCULATING DOCUMENT COPYING SYSTEM

Joachim Guenther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1977, Ser. No. 781,811
Int. Cl.² B65H *5/22*; G03B *27/48*
U.S. Cl. 355—50 **13 Claims**



1. In an automatic document handling system for recirculating a plurality of individual documents having pre-selected dimensions past an imaging station of a copier in a pre-collated order for making multiple collated copy sets from the documents, the improvement comprising:

document recirculation means for recirculating a plurality of individual documents toward and away from the imaging station while maintaining a separation between individual documents by shingling the documents in a partially separated, partially overlapping, configuation during a portion of said recirculation,

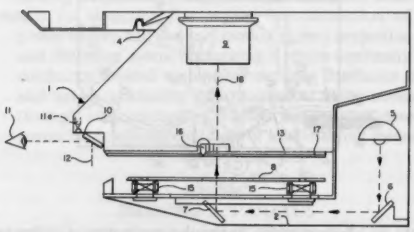
wherein a portion of said document recirculation means comprises a document transport which sequentially incrementally advances the documents transported thereon by a distance substantially less than a dimension of a document to provide said shingling.

4,093,373

MICROFICHE CAMERA EDITING DEVICE

Harry A. H. Spence-Bate, 115 Cheam Pl., P.O. Box 8, Morley, Australia (6062)

Filed Aug. 14, 1974, Ser. No. 497,463
Claims priority, application Australia, Aug. 15, 1973, PB4486
Int. Cl.² G03B *27/44, 27/04, 23/08*
U.S. Cl. 355—54 **10 Claims**



1. A microfiche editing and recording device for transmitting a microimage from a first microimage bearing film to a second photographic microfiche film comprising:

a microfiche camera;

a housing mounted to said microfiche camera, said housing being movably mounted to said microfiche camera so as to be moved on said camera to a storage position out of the optical axis of said microfiche camera when not in use as an editing device;

a means in said housing for defining an optical path, a portion of which is aligned with the optical axis of said microfiche camera;

a first film retaining means supported by said housing for holding said first microimage bearing film;

means connected to said first film retaining means for locating said first microimage bearing film in said first film retaining means in a plurality of predetermined X and a plurality of predetermined Y positions relative to said optical path;

means in said microfiche camera and connected to said second film for moving said second microfiche film to a plurality of predetermined X and a plurality of predetermined Y positions relative to said optical axis of said microfiche camera; and

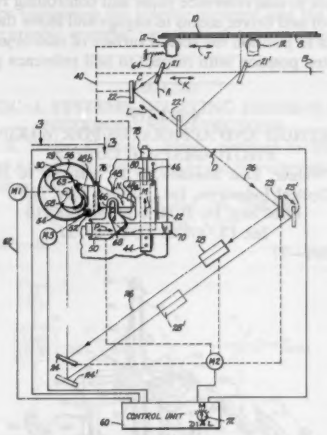
means for applying light from said first microimage bearing film to said second microfiche film along said optical path whereby the microimage on said first microimage bearing film is transferred to said second film.

4,093,374

MULTIPLE RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE

Edwin Zucker, Rochester; David K. Shogren, Ontario, and David N. Redden, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1976, Ser. No. 647,941
Int. Cl.[2] G03B 27/34, 27/40, 27/70
U.S. Cl. 355—57 **24 Claims**



1. A variable magnification reproduction machine comprising:

holding means comprising a platen for holding a document;

document scanning means including movable mirrors for scanning a document at said platen, said document scanning means comprising cam folllower means and a plurality of separate cam surfaces for driving said cam follower means which, in turn, imparts movement to said movable mirrors,

image receptor means for receiving an image of said document scanned by said document scanning means,

imaging means for focusing an image of said document onto said receptor means,

means for adjusting said imaging means for selecting between different document magnifications,

means responsive to said selected magnification for adjusting the scanning rate of said document scanning means in accordance with the selected magnification for each of said plurality of cam surfaces to thereby provide a continuously variable range of document magnifications for each cam surface, and

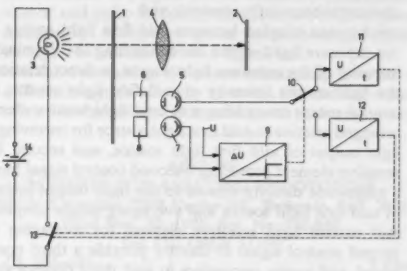
means responsive to the selected magnification for selecting one of said cam surfaces for driving said cam follower means.

4,093,375

METHODS AND APPARATUS FOR AUTOMATIC EXPOSURE CONTROL

Dorothee Griesch, Eltville; Herbert Schröter, Taunusstein; Peter Schwägler, Mainz, and Eckehard Stein, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Apr. 26, 1976, Ser. No. 680,461
Claims priority, application Germany, Apr. 28, 1975, 2518787
Int. Cl.[2] G03B 27/76, 27/78
U.S. Cl. 355—68 **31 Claims**



11. Photographic printing apparatus for printing from originals made on different types of photographic material, the apparatus comprising:

means to determine which of at least two types (such as silver halide or diazo film) of photographic material the original employs comprising means to examine the spectral transmission characteristics of said original,

means to determine the image density of the original, and

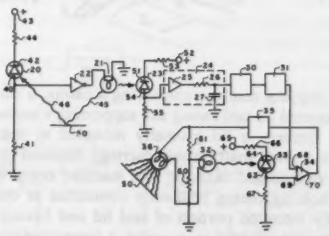
means to control the exposure in accordance with both the type of material as determined and the image density.

4,093,376

AUTOMATIC EXPOSURE CONTROL

Karavattuveetil George Rabindran, Morton Grove, and John R. Flint, Barrington, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 1, 1976, Ser. No. 691,733
Int. Cl.[2] G03B 27/78
U.S. Cl. 355—68 **13 Claims**



1. In a document recorder of the type having a document transport for feeding documents along a predetermined path, an exposure station within the predetermined path and including an exposure light source for illuminating each document as each document is presented to the exposure station to facilitate the photographing of the documents, an automatic exposure control system for controlling the illumination intensity of the

exposure light source to assure proper exposure of each document comprising:

a first light source arranged relative to the predetermined path for projecting light onto the documents to be recorded;

a first light sensitive element arranged relative to the predetermined path for receiving the light reflected from the documents originating from said first light source, said first light sensitive element providing a first control signal having a magnitude directly related to the intensity of said reflected light;

a feedback arrangement coupled between said first light sensitive element and said first light source for controlling the light output intensity of said first light source responsive to said first control signal to render the intensity of the reflected light received by said first light sensitive element substantially constant; and

control means coupled between said first light source and the exposure light source for controlling the illumination intensity of the exposure light source in direct relation to the light output intensity of said first light source, said control means comprising a second light sensive element arranged relative to said first light source for receiving the light output of said first light source, said second light sensitive element providing a second control signal having a magnitude directly related to the light output intensity of said first light source and averaging means coupled to said second light sensitive element for averaging said second control signal to thereby provide a third control signal, and means responsive to said third control signal for controlling the illumination intensity of the exposure light source.

4,093,377

COPYING MACHINE

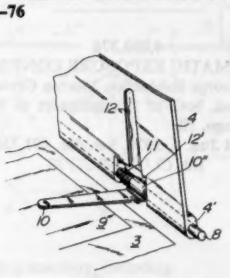
Hiroshi Tsuda, Mitaka, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,262

Claims priority, application Japan, Dec. 16, 1975, 50-168907[U]

Int. Cl.² G03B *27/62, 27/64*

U.S. Cl. 355—76 **3 Claims**



1. A copying machine employing a casing, a carriage movably mounted on said casing and supporting a manuscript to be copied thereon, a lid pivotally mounted at one side edge through a pivot shaft on said carriage disposed to cover said manuscript on said carriage; said machine comprising: manuscript holding means resiliently connected at one end to a pivotally mounted portion of said lid and having a free end projecting above said manuscript, a lower surface of said lid being formed with a depression for enclosing said manuscript holding means therein when said lid covers said manuscript; a connecting member resiliently connecting the one end of said manuscript holding means to said pivotally mounted portion of said lid, whereby said manuscript holding means being urged against said manuscript until said lid reaches an open position and separates from said manuscript as said lid further opens beyond said given open position.

4,093,378

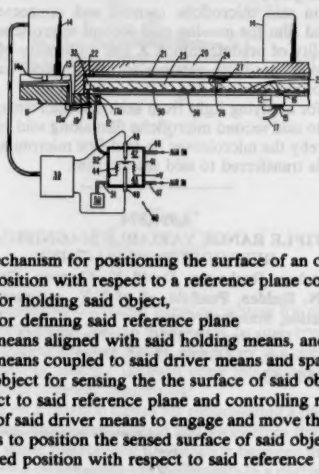
ALIGNMENT APPARATUS

Andrew Frederick Horr, Fairfax, and William Frederick White, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,819

Int. Cl.² G03B *27/62, 27/64*

U.S. Cl. 355—76 **11 Claims**



1. A mechanism for positioning the surface of an object in a selected position with respect to a reference plane comprising:

means for holding said object,

means for defining said reference plane

driver means aligned with said holding means, and

sensor means coupled to said driver means and spaced from said object for sensing the the surface of said object with respect to said reference plane and controlling respective ones of said driver means to engage and move the holding means to position the sensed surface of said object in said selected position with respect to said reference plane.

4,093,379

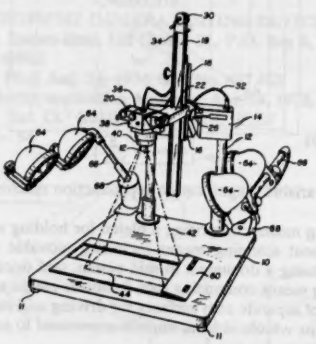
METHOD AND APPARATUS FOR MAKING PHOTOGRAPHIC COPIES

Manfred Weiner, East Meadow, N.Y., assignor to Ehrenreich Photo-Optical Industries, Inc., Garden City, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,210

Int. Cl.² G03B *27/52, 27/32*

U.S. Cl. 355—77 **3 Claims**



1. The method of composing and photocopying graphic material, which method comprises locating a copying camera, having a viewfinder in one wall thereof, in position to photograph an area of a work support, projecting light, from outside the camera, through the viewfinder of the camera toward the camera lens, through the camera lens and onto the work support to illuminate the area of the work support that the camera will photograph, preventing overheating of the camera by locating the source of light at such a distance from the camera that heating of the light source does not reach the camera, focusing the camera, as necessary, for photographing the area of the support that is illuminated by said light, composing the

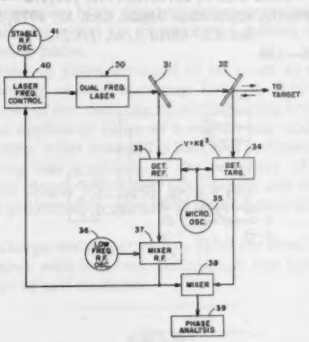
graphic material with respect to the limits of the illuminated area, supplying to the graphic material additional light for copying, and operating the camera, while in its light-projecting position, to photograph the graphic material, characterized by transmitting said light from its source to a viewfinder of the camera by passing the light through a fibre optic bundle to avoid heating of the eyepiece and the camera by the light source, using a camera that has a finder screen with marking thereon, and focusing the camera on the area to be photographed by adjusting the focus to bring the image of the markings on the finder's screen into sharp focus on the illuminated area of the work support, using copying lights to illuminate the graphic material when photographing said material with the camera, and composing the art material while the copying lights are extinguished so that the area illuminated by the light projected by the camera is clearly defined with light of lower intensity than that required for copying, maintaining the work support under low illumination during composing of the graphic material whereby the contrast is improved between the area illuminated by the light projected from the camera and adjacent surfaces of the work support, using a flat horizontal surface as the work support, locating the camera above the support with the projection axis substantially normal to said support, holding the camera on a mechanically adjustable holder that shifts the camera toward and from the work support to obtain a desired field of coverage, using as the copying camera a reflex camera having its objective lens at the front of the camera and its viewfinder at the back of the camera, and projecting the light through a viewfinder to illuminate the area on the work support whereby the light projected on the work support for composing the graphic material, and the light that copies the graphic material, pass through the same camera lens.

4,093,380

OPTICAL SYSTEMS UTILIZING THREE-WAVE HETERODYNE DETECTORS

Matthew B. White, Cohasset, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1976, Ser. No. 738,989
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—5 **5 Claims**



1. In an optical ranging system for determining the distance to a remote reflecting target, the combination of

means for generating at a first site a composite signal having two optical signal components ω_1 and ω_2;

means for directing said composite signal toward said remote target and for receiving the signal reflected therefrom;

a first and second optical signal detector which operate on the heterodyne principle;

means for directing said composite signal onto said first detector and said received reflected signal onto said second detector;

a first and second mixer;

means for coupling the output of said first detector to one input of said first mixer and the output of said second detector to one input of said second mixer;

a radio frequency oscillator;

means for generating a microwave signal, ω_{mw};

means for coupling said microwave signal to both said first and second detectors,

the two optical signal components of said composite signal and said received reflected signal interacting with said microwave signal to produce first and second difference signals of frequency $\omega_{mw} - \omega_2 + \omega_1$; and

means for coupling said radio frequency oscillator to the other input of said first mixer;

means for coupling the output of said first mixer to the other input of said second mixer whereby the output of said second mixer is a signal whose frequency corresponds to that of said radio frequency oscillator and whose phase is independent of any slow phase variations in said composite signal or said microwave signal; and

means for determining the phase relationship between said difference signals whereby to obtain a parameter which is related to the distance from said site to said remote target.

4,093,381

METHOD FOR ASSAYING ENDOTOXINS

Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014

Filed Nov. 29, 1976, Ser. No. 745,966
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—51 **3 Claims**

1. A method for assaying endotoxins in aqueous liquids comprising the following steps:

a. introducing a known volume of an aqueous liquid containing lipopolysaccharide endotoxins of the bacteria selected from the group consisting of *E. coli* 0127:B8, *E. coli* 055:B5, *S. abortus equi, S. enteritidis* and *S. flexneri*

b. maintaining the temperature of the sample in the cell at between 20° and 30° C,

c. passing ultra-violet radiation of a wave length between 200 and 800 nm thru said liquid sample in the cell,

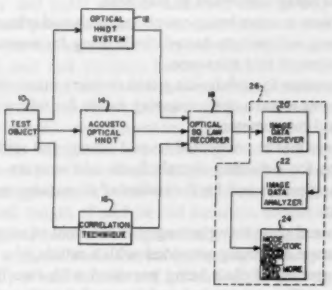
d. measuring the absorbance of the detecting radiation at 259 nm.

4,093,382

HYBRID HOLOGRAPHIC NON-DESTRUCTIVE TEST SYSTEM

Robert L. Kurtz, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 14, 1976, Ser. No. 686,331
Int. Cl.[2] G01N *21/00*; G02B *27/00*; G01N *3/00*
U.S. Cl. 356—72 **7 Claims**



1. A hybrid non-destructive testing system for determining the presence of inhomogeneities in a test object comprising:

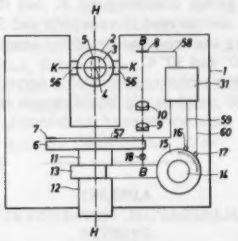
(a) an optical testing subsystem selectively operable to produce image data information of the object in the form of an optical hologram for detecting surface or subsurface flaws;
(b) an acousto/optical testing subsystem selectively operable to produce image data information of the object in the form of an optical hologram for detecting interior flaws;
(c) a correlation testing subsystem selectively operable to produce image data information of the object in the form of an optical hologram for determining the exact location and magnitude of flaws whose presence has been determined by the results of selective operation of the other subsystems of the testing system;
(d) real-time single format detector/read-out means for accepting image data information from the three subsystems; and
(e) optical receiver/analyzer means for analyzing image data information accepted by the detector/read-out means.

4,093,383

ANGLE MEASURING DEVICE WITH A TELESCOPE

Wieland Feist; Klaus Junghanns, and Alfred Kunz, all of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Dec. 16, 1976, Ser. No. 748,623
Claims priority, application Germany, Jan. 9, 1976, 01190745
Int. Cl.² G01B *11/26;* G01C *1/00, 1/06*
U.S. Cl. 356—152 **1 Claim**



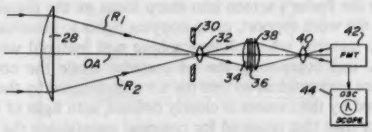
1. An angle measuring device comprising
a base,
a telescope being seated for rotation about at least one axis relative to said base,
at least one graduated circle being provided with at least one line division of equally spaced intervals, said graduated circle being connected to said base,
at least one scanner being connected with said telescope said scanner and said graduated circle being for measuring the rotations of said telescope,
a micrometer for subdividing said division intervals,
at least one electro-optic scanning means for taking readings on said micrometer,
electronic means connected to said scaner and said reading means for detecting signals from said scanner and said reading means and for formation of an angular measuring result,
a graduated plate being arranged in the field of view of said telescope and being provided with a reticle,
said graduated plate being provided with two lines substantially symmetrical and in parallel with one line of said reticle and being spaced apart from said one line by at least the width of one division interval of said line division.

4,093,384

NARROW ANGLE, NARROW BANDWIDTH OPTICAL RECEIVER SYSTEM

Gerald D. Ferguson, Yardley, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,523
Int. Cl.² G01J *3/48*
U.S. Cl. 356—186 **11 Claims**



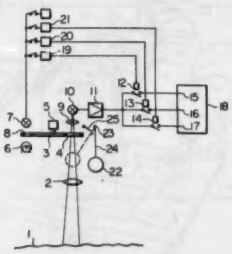
1. An optical system for receiving radiation reflected from an area illuminated by light of a specific frequency, comprising, in combination:
receiving means adapted to receive the reflected radiation over a narrow field of view for forming an imaged output, said receiving means including a circular collecting lens positioned at the input thereof;
interference filter means optically connected to receive said receiving means output including a flat top filter element in which said specific frequency is at the low end of the bandpass for normal incidence of radiation and at the high end for maximum incidence of radiation; and
detector means optically connected to receive the passed radiation from said filter means for producing an output signal when said detector means is illuminated by radiation at the specific frequency.

4,093,385

COLOR GRADIENT ANALYZER

Murata Noboru, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1976, Ser. No. 730,472
Claims priority, application Japan, Oct. 17, 1975, 50-124407
Int. Cl.² G01J *3/48, 1/02*
U.S. Cl. 356—188 **6 Claims**



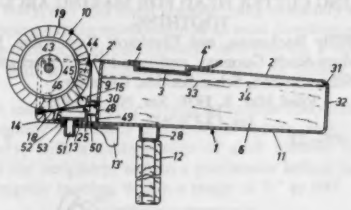
1. A color gradient analyzer comprising a rotational filter having a plurality of optical color filters, a motor for rotating the rotational filter, a photo-electric converter positioned observable an object illuminated by the natural sun to be analyzed through one of said color filters, a white ball positionable between the photo-electric converter and an object to be analyzed, said white ball being able to be illuminated by the sunlight, a plurality of relays connected to the output of the photo-electric converter, a recorder connected to the outputs of said relays, means for providing the signal concerning the rotational angle of the rotational filter, and a plurality of delay circuits connected between said means and said relays.

4,093,386

DEVICE FOR APPLICATION OF LIQUID PRODUCTS, SUCH AS PAINT, GLUE AND THE LIKE

Stig Gunnar Lundgren, and Lars Johan Tornell, both of Goteborg, Sweden

Filed Oct. 27, 1976, Ser. No. 736,162
Int. Cl.[2] B44D 3/28
U.S. Cl. 401—219 6 Claims



1. An improved device for application of liquid products such as paint, glue and the like, comprising a container holding the aforesaid liquid, and an applicator roller, said roller mounted at the front wall of said container, a discharge opening formed in said front wall of the container, said opening communicating the interior of said container with said applicator roller,

an elongated chamber arranged intermediate said discharge opening of said container and said applicator roller, said chamber positioned underneath said roller and having a paint supply slot formed in its top section, said paint supply slot extending in the longitudinal direction of said applicator roller,

wall sections positioned in front of said container and above said chamber at the ends thereof, mounting plates for attachment of said applicator roller, said mounting plates removably arranged on said wall sections, a number of attachment elements arranged on said mounting plates in symmetrical positions relative to a certain point on each one of said plates, said attachment elements serving to retain said mounting plates to said wall sections,

a plurality of mounting holes in said mounting plates to receive therein the trunnion ends of said applicator roller, said mounting holes disposed non-symmetrically relative to said point and in mirror-image fashion in the two mounting plates,

said mounting plates arranged to be re-set so as to allow positioning of said mounting holes in their individual positions of use, each one of said mounting holes intended for an applicator roller of a certain size and type, said applicator roller mounted in said wall sections in a manner ensuring that a portion of the periphery of said roller extends closely above said paint supply slot and that said roller projects above as well as beyond these wall sections, and

said discharge opening extending along the front wall of said container with its lower delimitation line level with the bottom of said container.

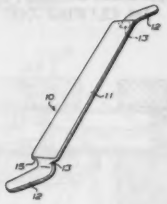
4,093,387

FASTENER FOR DETACHABLY INTERCONNECTING PUNCHED DOCUMENTS

Otto Julius Jönsson, Malmo, Sweden, assignor to AB Malmo PAC, Malmo, Sweden

Continuation of Ser. No. 385,198, Aug. 2, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,766
Int. Cl.[2] B42F 3/00
U.S. Cl. 402—19 1 Claim

1. An improved one-piece fastener in the form of a thin flat strip of resilient material for detachably interconnecting punched documents assembled in a sheaf, comprising an elongated planar intermediate portion adapted to engage, at one of the flat surfaces thereof, the sheaf of documents between the holes therein on one side of the sheaf, a planar end portion at each of the opposite ends of the intermediate portion having reduced width with respect to said intermediate portion, said end portions being disposed in a common plane essentially parallel to the plane of the intermediate portion but displaced transversely thereof and extending away from each other, and a web integrally interconnecting said intermediate portion and each of said end portions and forming a step therebetween, said



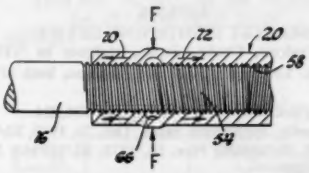
end portions being insertable each through one hole in the sheaf from the said one side thereof in order to extend along the opposite side of the sheaf, with said webs extending through the holes, wherein the improvement resides in that the end portions are angled in said essentially parallel plane in opposite directions in relation to said intermediate portion to form laterally projecting tongues.

4,093,388

TIE ROD ASSEMBLY FOR VEHICLES

Robert I. MacArthur, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 635,682
Int. Cl.[2] F16B 17/06
U.S. Cl. 403—46 3 Claims



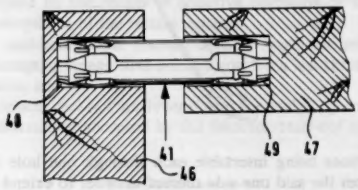
1. A tie rod assembly in a vehicle steering linkage comprising inner and outer tie rod members, said tie rod members having end portions space from each other, one of said end portions having a peripheral thread of a right-hand lead, the other of said end portions having a peripheral thread of a left-hand lead, an adjuster sleeve extending between said tie rod members, said sleeve being a tubular member of deformable metal with complementary right and left hand internal threads that engage the respective right and left hand threads of said end portions of said tie rod members, said adjuster sleeve being rotatable relative to said tie rod members to adjust the overall length of said tie rod members connected thereto, said adjuster sleeve having radially projecting bead means integral with the walls thereof encircling and located radially outwardly of said tie rods and inboard of the ends thereof, said bead being partially constricted radially inwardly to reduce its diameter and longitudinally displace material of said sleeve and thereby laterally load the engaged threads to maintain the tie rods and sleeve in an adjusted position.

4,093,389

CONNECTION AND FASTENING ELEMENT FOR CONNECTING WORKPIECES OF SOFT MATERIAL, ESPECIALLY DOWELS FOR PRESSBOARDS OR PARTS OF WOOD

Günter Wibrow, Norderstedt, Germany, assignor to ITW-Ateco G.m.b.H., Norderstedt, Germany

Filed Oct. 12, 1976, Ser. No. 731,597
Claims priority, application Germany, Oct. 14, 1975, 2545859
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—280 7 Claims



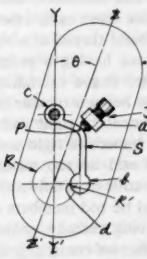
1. A one-piece sheet metal connection and fastening element adapted for connecting workpieces of relatively soft material having predetermined depth blind bores therein, said fastening element including a hollow pin bent from flat sheet metal stock having in at least one end thereof a plurality of circumferentially spaced axially extending elongated openings spaced from the ends of the pin, said elongated openings being provided in parallel spaced arrangement at a predetermined distance from the end of said at least one end portion and forming between said elongated openings a plurality of webs integrally connected at their opposite ends and adapted to be bent outwardly intermediate the extremities of said webs, a sheet metal, sleeve-like reinforcing member surrounded by and integral with the hollow pin, said member extending a predetermined distance into the end portions carrying said webs whereby said at least one end portion can be axially upset in the blind bore of said workpiece with at least partial portions of said webs being vaulted radially outwardly in a direction towards and into the wall of said bore.

4,093,390

BRACKET TIGHTENING DEVICE

Zenzaburo Tsukmo, Osaka, Japan, assignor to NTN Toyo Bearing Co. Ltd. and Zenzaburo Tsukumo, both of Osaka, Japan

Filed Oct. 27, 1976, Ser. No. 736,224
Claims priority, application Japan, Oct. 29, 1975, 50/130687; Oct. 29, 1975, 50/130688; Nov. 18, 1975, 50/139104; Nov. 18, 1975, 50/139105
Int. Cl.[2] F16B 2/02, 7/04
U.S. Cl. 403—373 7 Claims



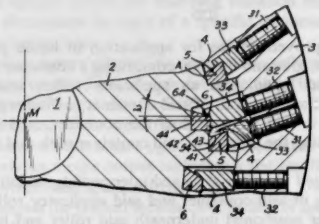
1. A device for tightening a bracket on a round rod or shaft by making use of resiliency, comprising an intermediate body having sufficient resiliency within the restorable elastic limits, one end of said intermediate body being pivotally mounted at a fixed point on the bracket, the other end thereof being engaged at a fixed point on the outer surface of the rod or shaft on which the bracket is to be tightened, an adjusting screw attached to said bracket and having its front end abutting against the intermediate portion of said intermediate body.

4,093,391

MILLING CUTTER HEAD FOR MAKING ARCUATE TOOTHING

Lothar Willy Bachmann, and Eberhardt Karl Reise, both of Karl-Marx-Stadt, Germany, assignors to VEB Werkzeugkombinat Schmalkalden, Schmalkalden, Germany

Filed Mar. 8, 1976, Ser. No. 665,059
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—22 7 Claims



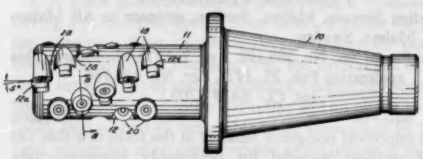
1. A milling cutter head for making arcuate toothing, the head having a main axis (M), comprising a substantially disk-shaped carrier body (2) with a locking ring (3) surrounding the same; said body having therein at least one pair of grooves (4) of a stepped cross-section, for a corresponding number of pairs of removably inserted, substantially axially extending outer (5) and inner (6) milling cutters, said grooves having different distances from the main axis; said cutters having head cutting edges (17) in head regions thereof, that partially overlap between adjoining cutters of a pair, and corresponding flank cutting edges (18); wherein said cutters both have cylindrical body surfaces (51 . . . 54, 61 . . . 64) that are substantially rectilinear along the entire cutting lengths; said body surfaces including chip bearing surfaces (54, 64) and associated limiting surfaces (53, 62), which latter adjoin said flank cutting edges; wherein the inclination angle (Ψ) defined between said chip bearing and said limiting surfaces is smaller than 90°; and wherein at least one of said chip bearing surfaces is substantially planar along said entire cutter length and constitutes a main active cutting surface from the outer end of the respective cutter to its cutting edge.

4,093,392

MILLING CUTTER

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Oak Park, Mich.

Filed Apr. 10, 1975, Ser. No. 566,727
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—48 28 Claims



1. An indexable insert milling cutter comprising an annular cylindrical body, a plurality of individual insert pockets formed in the cylindrical periphery of said body, each of said

pockets having a seat for holding an insert with its cutting face in a substantially axial plane modified to the extent of any axial and radial rake angles which are the same for every insert, and a minor portion of its cutting edge projecting beyond said periphery, each pocket having a chip clearance wall associated therewith, said wall providing chip clearance space projecting from the entire cutting face to the periphery of said body, each pocket with its chip clearance wall being substantially isolated from every other pocket by surrounding cylindrical periphery of said body, and said insert pockets being uniformly spaced in overlapping cutting relationship in an axial direction and angularly spaced in a circumferential direction on a continuous helical path for progressive cutter entry in milling a workpiece.

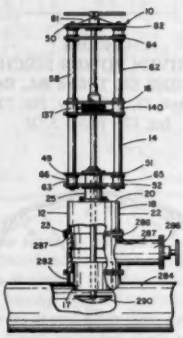
25. A milling cutter comprising an annular body constructed for mounting a plurality of individual cutting elements on its periphery, with a cutting edge of each element extending beyond the periphery, and on a continuous helical path, with equal angular spacing, within a range of 91° to 100°.

4,093,393

TAPPING MACHINE

Garland Y. Smith, Hinsdale, and Gerald R. Scott, Elmhurst, both of Ill., assignors to Garland Smith Engineering Co., Inc., Hinsdale, Ill.

Filed Sep. 8, 1976, Ser. No. 721,396
Int. Cl.² B23B *47/16*
U.S. Cl. 408—67 **21 Claims**



1. A tapping machine comprising: a base adapted for fixed connection to a structure to be tapped; an elongated frame connected to said base; a movable balanced drive assembly mounted on said elongated frame, said movable balanced drive assembly being movable along said elongated frame relative to said structure to be tapped, said movable balanced drive assembly having a boring bar longitudinally fixed to a portion of the movable balanced drive assembly, said movable balanced drive assembly including a plurality of motors, each motor of said plurality being spaced equidistantly about said boring bar, a plurality of axially spaced driven members drivingly connected to said boring bar, each motor of said plurality being connected drivingly to a respective one of said plurality of driven members; and a cutter drivingly connected to said boring bar, said cutter being adapted to engage cuttingly a surface of the structure to be tapped.

4,093,394

DOWEL HOLE-BORING JIG

Arthur Adams, c/o Karl Davenport, 9614 Heatherdale Dr., Dallas, Tex. 75243

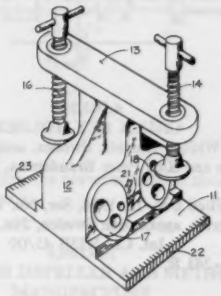
Filed Jul. 5, 1977, Ser. No. 812,573
Int. Cl.² B23B *49/00*
U.S. Cl. 408—103 **8 Claims**

1. A dowel hole boring jig comprising:

at least one right circular cylinder longitudinally pierced by at least one round cross-section hole having a selected diameter equal to a dowel hole bit diameter, said hole extending from a first end of the cylinder to the other end thereof;

a portable base;

a frame secured to said base and provided with at least one circular cross section aperture shaped, sized and positioned to hold said cylinder in a horizontal position above and parallel to the base;



first clamp means secured in said frame above and beyond said cylinder's first end whereby a first work piece can be clamped adjacent to the cylinder's first end in positon to be bored by a bit passed through said hole from said other end thereof; and

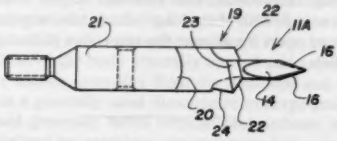
second clamp means secured in said frame above and beyond said cylinder's other end whereby a second work piece can be clamped adjacent to the cylinder's other end in position to be bored by a bit passed through said hole from said first end thereof.

4,093,395

DRILL AND COMBINED DRILL COUNTERSINK

William K. Luebbert, St. Louis County; Thomas O. Blankenship, Marthasville, and Roy H. Freeman, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 14, 1977, Ser. No. 777,177
Int. Cl.² B23B *51/00, 31/44*
U.S. Cl. 408—224 **7 Claims**



1. A drill for producing holes of close tolerance in non-ferrous and non-metallic composite materials, said drill comprising an axially elongated body having a cylindrical form with diametrally opposite substantially flat first surfaces which taper convergently toward one end of said body from the cylindrical body remote from said one end, said first surfaces having diametrally opposite margins substantially coextensive with said first flat surface and conforming to the cylindrical shape of said elongated body, and said one end of said body being formed with similar substantially flat drill point surfaces convergently directed toward the longitudinal axis of said body from each of said opposite side margins, said drill point surfaces and said first surfaces meeting along first edges forming the cutting edges for said drill and meeting along second edges spaced behind said cutting edges in the direction of drill rotation, said drill point surfaces being oppositely angled rela-

tive to each other to lay back of said associated cutting edges and directed to converge from said opposite margins to intersect along a line which constitutes a chisel edge on said one end of said body.

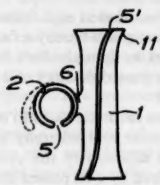
5. The drill set forth in claim 1 wherein a second cylindrical body is carried by said first mentioned body, said second body having a diameter larger than said first mentioned body and formed with a countersink drill face presented to said first mentioned body in position to perform a countersink operative in sequence with said cutting edges forming a hole.

4,093,396

CHUCK KEY HOLDER

Sven Holger Widigs, Gustafs, Sweden, assignor to Lars Gosta Brandstrom and Karl Peter Brandstrom, both of Soderhamn, Sweden

Filed Dec. 15, 1976, Ser. No. 750,651
Claims priority, application Sweden, Jan. 30, 1976, 7600992
Int. Cl.[2] B23B 45/00
U.S. Cl. 408—241 R 5 Claims



1. A chuck key holder for releasably securing a chuck key to the electric cable of an electrically drivable hand tool comprising: a first tubular collet formed of a slightly elastic material and having a radial slot therein extending the axial length thereof, said first collet thus being elastically separable in the region of said slot for reception of an electric cable therewithin; and a second tubular collet formed of a slightly elastic material and having a radial slot therein extending the axial length thereof, said second collet thus being elastically separable in the region of said slot for reception of an element of a chuck key therewithin; said first and second collets being interconnected with their longitudinal axes angularly offset and spaced apart by at least the respective radius of each of said collets.

4,093,397

HIGH VACUUM PUMP

Grady R. Lovelady, 1624 San Altos Pl., Lemon Grove, Calif. 92045

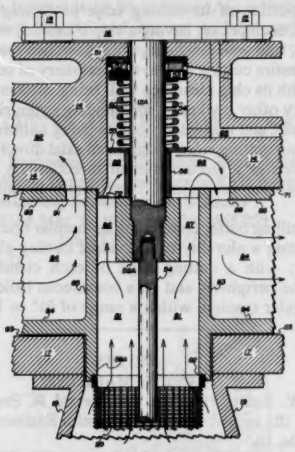
Filed Apr. 15, 1976, Ser. No. 677,249
Int. Cl.[2] F04D 5/00
U.S. Cl. 415—53 R 7 Claims

1. A high vacuum pump comprising:

a generally cylindrical housing having a housing inlet and a housing outlet,

an impeller assembly having a rotor hub in the center thereof rotatably mounted eccentrically of the axis of said housing, said hub defining a passageway extending the length thereof and forming an intake at one axial end thereof;

an outlet at the other axial end of said hub, said outlet communicating via an inlet chamber in said housing with impeller blades in said impeller assembly on one radial side thereof; and



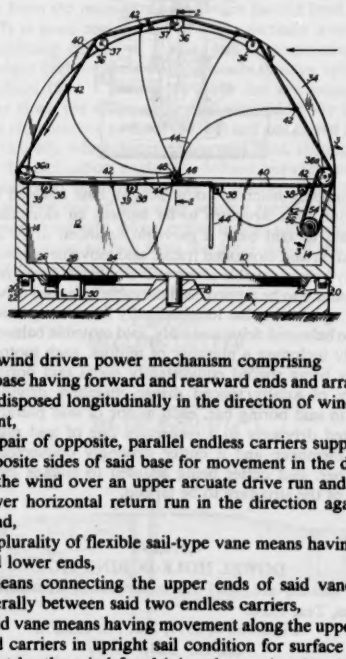
an exhaust duct on the other radial side of said impeller assembly extending radially from the axis of said rotor hub.

4,093,398

WIND DRIVEN POWER MECHANISM

Denver W. Miller, 10208 SE. Tilford Rd., Boring, Oreg. 97009

Filed Sept. 23, 1976, Ser. No. 725,758
Int. Cl.[2] F03D 5/02
U.S. Cl. 416—8 2 Claims



1. A wind driven power mechanism comprising

(a) a base having forward and rearward ends and arranged to be disposed longitudinally in the direction of wind movement,

(b) a pair of opposite, parallel endless carriers supported at opposite sides of said base for movement in the direction of the wind over an upper arcuate drive run and along a lower horizontal return run in the direction against the wind,

(c) a plurality of flexible sail-type vane means having upper and lower ends,

(d) means connecting the upper ends of said vane means laterally between said two endless carriers,

(e) said vane means having movement along the upper run of said carriers in upright sail condition for surface engagement by the wind for driving the carriers longitudinally and having movement along the return run of said carriers in a collapsed condition uninfluenced by the wind,

(f) a pair of horizontal axis idler wheels on said base disposed between said upper and return runs and being concentric with said upper arcuate drive run,

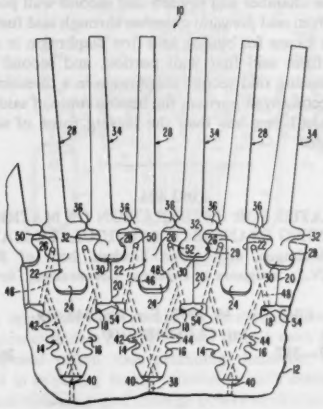
(g) and means connecting the lower ends of said vane means to respective ones of said idler wheels whereby the lower ends of said vane means rotate with said idler wheels as the vane means move around the latter in the drive and return runs by wind engagement in the drive run of the carriers.

4,093,399

TURBINE ROTOR WITH CERAMIC BLADES

Robert G. Glenn, Huntington Valley, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 1, 1976, Ser. No. 746,443
Int. Cl.² F01D *5/08, 5/30*
U.S. Cl. 416—95 **8 Claims**



1. In a gas turbine rotor: a rotor disk having a number of circumferentially spaced, outer peripheral grooves, an attachment piece for each groove of the rotor disk, respectively, the attachment pieces having respective roots received within corresponding grooves of said rotor disk; a plurality of ceramic rotor blades, each blade having a root; and means on said attachment pieces at the radially outer margins thereof for forming root-receiving grooves, the roots of said blades being received within respective grooves of said attachment pieces, said attachment pieces having structure isolating the rotor disk from gases impinging on said blades, said rotor disk and said attachment pieces having fluid passages therein forming parts of a closed path to permit the circulation of a coolant through the attachment pieces.

4,093,400

CROSS BEAM ROTOR

Robert Charles Rybicki, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1976, Ser. No. 751,006
Int. Cl.² B64C *27/38*
U.S. Cl. 416—141 **9 Claims**

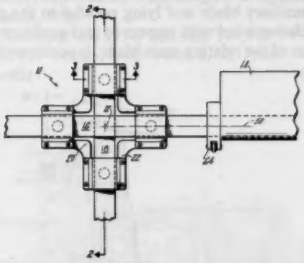
1. A helicopter rotor adapted to be mounted for rotation about an axis of rotation and comprising:

a spar member flexible in flapping, in-plane bending, and in twisting and extending through and on opposite sides of said axis or rotation and having a feathering axis about which said twisting occurs,

a blade positioned at opposite ends of said spar and supported therefrom for rotation therewith,

a hub member supporting said spar for rotation about said axis of rotation and connected thereto, and

means connecting said spar to said hub comprising two spherical bearings supported from said hub at stations on opposite sides of said rotational axis and each supporting



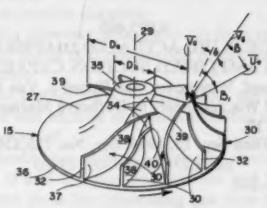
said spar therefrom for universal motion about a point on said feathering axis.

4,093,401

COMPRESSOR IMPELLER AND METHOD OF MANUFACTURE

Homer E. Gravelle, Arvada, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 12, 1976, Ser. No. 676,264
Int. Cl.² F04D *17/10*
U.S. Cl. 416—185 **22 Claims**



1. A centrifugal compressor impeller, comprising;

a body formed as a truncated, generally conical body of revolution with a longitudinal axis of rotation, a circular cross section transverse to said axis and an arcuate axial section;

a plurality of impeller blades on the surface of the conical body adjacent the ase thereof, each impeller blade including a generally radial section extending from an outer end at the base of the body generally toward said axis and an inducer section extending from the truncated end of the body, in a generally axial direction to mmerge smoothly with said generally radial section, each inducer section being defined by parabloic curves wrapped on a series of cylindrical surfaces concentric with the impeller axis, the origin of each parabolic curve being in a plane transverse to the impeller axis and spaced a preselected distance from the truncated end of said body.

4,093,402

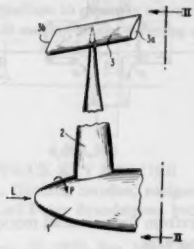
PROPELLER OR A SET OF WINGS FOR A WIND MILL

Theodoor Van Holten, Thorbeckelaan 66, Pijnacker, Netherlands

Filed Nov. 9, 1976, Ser. No. 740,090
Int. Cl.² F03D *1/06*
U.S. Cl. 416—236 A **7 Claims**

1. A propeller or a set of wings for a wind mill or such a device for deriving or absorbing energy from a flow of fluid such as the wind, comprising a rotatable supported hub with at least one mainly radially extending blade having a cross section in the shape of a "wing profile" and a blade angle varying

along the length of the blade, said blade being provided with at least one auxiliary blade with a cross section in the shape of a "wing profile", which auxiliary blade as seen in a sectional plane going through the midchord point of the average chord of said auxiliary blade and lying parallel to the plane, defined by the relative wind with respect to said auxiliary blade and the centerline of the relating main blade, is positioned such that the



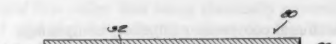
elongation of the chord lying in said sectional plane and starting from said midchord point and going through the leading edge of said auxiliary blade will interest a line positioned in said plane and running parallel to said relative wind and through the rotational axis of the hub of the propeller, wherein said auxiliary blade is mainly rectangular, the leading edge of it being positioned about normal to the relative direction of flow, the leading and trailing edges being situated in one flat plane.

4,093,403

MULTISTAGE FLUID-ACTUATED DIAPHRAGM PUMP WITH AMPLIFIED SUCTION CAPABILITY

Carl F. Schrimpf, Wauwatosa, and Russel J. Van Rens, Waukesha, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 15, 1976, Ser. No. 723,334
Int. Cl.² F04B *3/00, 43/06*
U.S. Cl. 417—246 **14 Claims**



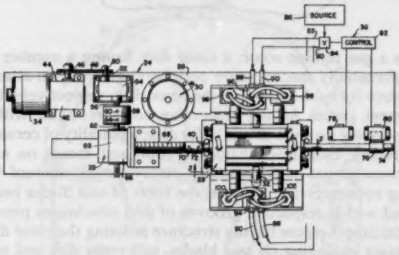
1. A fluid actuated fuel pump comprising means defining separate inlet and outlet chambers each including respective first and second wall portions, a first flexible diaphragm disposed in said inlet chamber and separating said inlet chamber into a first pulse chamber and a suction chamber including said first wall portion, said first diaphragm being movable away from and toward first wall portion, a fuel intake through which fuel is admitted into said suction chamber, a second flexible diaphragm in said outlet chamber and separating said outlet chamber into a second pulse chamber and a pressure chamber including said second wall portion, said second diaphragm being movable away from and toward said second wall portion, fuel transfer means communicating between said suction and pressure chambers and through which fuel is pumped from said suction chamber to said pressure chamber when said first diaphragm is moved toward said first wall portion, a fuel outlet through which fuel is pumped from said pressure chamber when said second diaphragm is moved toward said second wall portion, a first pressure inlet communicating with said first pulse chamber and adapted for connection to a first source of regularly cycling pressure pulses, a second pressure inlet communicating with said second pulse chamber and adapted for connection to a second source of regularly cycling pressure pulses, the second source of pressure pulses being of substantially equal intensity as the first source of pressure pulses and at least 90° out of phase from the first source of pressure pulses, whereby said first diaphragm in response to the cyclical pressure variations in said first pulse chamber alternately moves away from said first wall portion to draw fuel into said suction chamber through said fuel intake and toward said first wall portion to pump fuel from said suction chamber into said pressure chamber through said fuel transfer means and whereby said second diaphragm sequentially with respect to said first diaphragm and in response to cyclical pressure variations in said second pulse chamber alternatively moves away from said second wall portion to admit fuel being pumped through said fuel transfer means by said first diaphragm into said pressure chamber and toward said second wall portion to pump fuel from said pressure chamber through said fuel outlet, first biasing means for biasing said first diaphragm in a direction away from said first wall portion, and second biasing means for biasing said second diaphragm in a direction away from said second wall portion, the biasing force of said second biasing means being less than the biasing force of said first biasing means.

4,093,404

APPARATUS FOR PREPARATION OF MATRICES CONTAINING FRANGIBLE PARTICULATE MATTER

John W. Soehngen, and Albert Gerken, both of Berkeley Heights, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,639
Int. Cl.² F04B *9/00*
U.S. Cl. 417—317 **26 Claims**



1. In matrix preparation apparatus having matrix supply means, reservoir means for supplying a flow of frangible particulate material, and mixing means for dispersing the flow of frangible particulate material in the matrix, the improvement being means for supplying the frangible particulate material to the mixing means comprising:

reciprocable pump means having a first annular pump chamber and a second annular pump chamber, coaxially alligned and alternately operable, for continuously pumping the flow of frangible particulate material at a uniform metered rate without substantial impairment of frangible particles;

manifold means communicating with the reservoir means, the mixing means and the first and second pump chambers, for conveying the flow from the reservoir means to one of the first and second pump chambers and from the other of the first and second pump chambers to the mixing means; and

control means connected with the manifold means for diverting the flow from the reservoir means to the first and second pump chambers and for simultaneously connecting

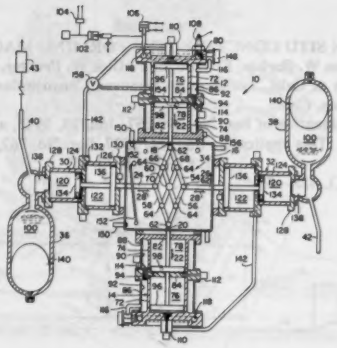
the first and second pump chambers with the mixing means such that one pump chamber communicates with the reservoir means while the other pump chamber communicates with the mixing means.

4,093,405

FUEL-OPERATED DEVICE

William Stanley Brian, 25 Landing Rd., Huntington, N.Y.

Filed Feb. 2, 1977, Ser. No. 764,751
Int. Cl.[2] F04B *17/00, 35/00;* F02B *75/32*
U.S. Cl. 417—343 6 Claims



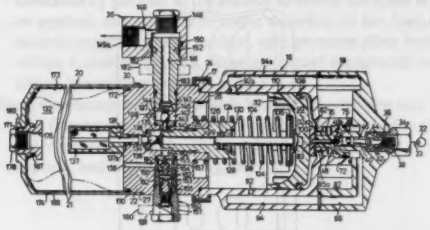
1. An improved fuel-operated device comprising a pair of combustion cylinders having pistons therein each having slidably disposed piston rods extending therefrom operatively arranged in opposing facing relation to each other such that said piston rods are urged through power strokes towards each other along a first movement path, means for admitting a gas-producing type fuel for said combustion cylinders effective to cause an initially maximum pressure expanding gas in said cylinders for powering said piston rods through said power strokes, a pair of pressure transfer fluid cylinders having pistons therein each having slidably disposed piston rods extending therefrom operatively arranged in opposing facing relation to each other such that said piston rods are urged through fluid pressure strokes away from each other along a second movement path oriented perpendicularly and in crossing relation to said first movement path, passage means connected from said pressure transfer fluid cylinders to a storage means for flowing said pressure transfer fluid thereto, an outlet connection from said storage means to a pressure fluid-operated motor for allowing said pressure transfer fluid to power said motor in operation in the performance of work utilizing said pressure transfer fluid energy, and a coupling linkage means strategically located at the intersection of said first and second movement paths operatively interconnected between said piston rods of said combustion and said pressure transfer fluid cylinders so as to produce said fluid pressure strokes in the latter in response to said power strokes of the former, said coupling linkage means including pivotally interconnected links in a diamond-shaped configuration effective to initially cause an amplification of said movement occurring along said first movement path in said corresponding extent of movement occurring along said second movement path and subsequently a reversal therein, whereby despite an initial maximum pressure in said expanding gas of said fuel there is produced in said fluid a pressure at a desirable starting minimum value which subsequently builds up therein to thereby contribute to the efficiency of the conversion of said fuel energy into usable pressure fluid energy.

4,093,406

FLUID OPERATED HYDRAULIC PUMP INCLUDING NOISE REDUCTION MEANS

Douglas P. Miller, Milwaukee, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 25, 1976, Ser. No. 717,761
Int. Cl.[2] F04B *17/00;* F01N *3/06, 1/08*
U.S. Cl. 417—401 3 Claims



1. In a gas driven motor for driving a hydraulic fluid pump: a gas chamber in said motor; and a muffler for exhausting gas from said gas chamber of said motor to a region of pressure relief and for reducing noise generated by such exhaustion, said muffler comprising:

an annular expansion chamber;

a first port for directing pressurized gas from said gas chamber of said motor into one portion of said annular expansion chamber;

a plurality of second ports for exhausting gas from another portion of said annular expansion chamber to said region of pressure relief;

and baffle means located in said expansion chamber on opposite sides of said first port and between said first port and said second ports for controlling gas flow between said first port and said second ports, said annular expansion chamber being defined by a pair of spaced apart end walls, a circumferential side wall extending between said end walls, and a projection extending between said end walls; said first port being located in said annular expansion chamber on one side of said projection; and said plurality of second ports being located in said annular expansion chamber on another side of said projection, said baffle means comprising:

a pair of spaced apart first baffles disposed on opposite sides of said first port, each first baffle extending between said end walls and from said circumferential side wall and extending toward but spaced from said projection, each first baffle defining a first passage near said projection;

a pair of spaced apart second baffles disposed on opposite sides of and spaced from said pair of first baffles, each second baffle extending between said projection and said circumferential side wall and from one of said end walls and extending toward but spaced from the other of said end walls, each second baffle defining a second passage near the other of said end walls;

and a pair of spaced apart third baffles disposed on opposite sides of and spaced from said second baffles, each third baffle extending between said projection and said circumferential side wall and from the other of said end walls and extending toward but spaced from said one of said end walls, each third baffle defining a third passage near said one of said end walls;

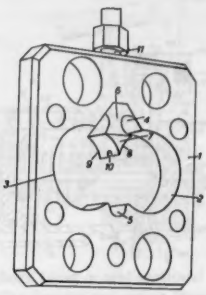
said passages causing gas entering said first port to be directed by said baffle means through said first, second, and third passages and through said second ports.

4,093,407

INJECTION OF ADDITIVES INTO LIQUID STREAMS

David Roy Miles, Pontypool, England, assignor to Imperial Chemical Industries Inc., London, England

Division of Ser. No. 411,167, Oct. 30, 1973, Pat. No. 4,015,828.
This application Dec. 10, 1976, Ser. No. 749,562
Int. Cl.[2] F01C *1/18, 21/12;* F04C *1/08;* B01F *5/14*
U.S. Cl. 418—15 3 Claims



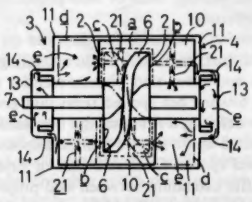
1. Apparatus for incorporating an additive into a liquid stream comprising a centre plate containing at least two intersecting circular openings, gear wheels rotatably mounted in said openings and each in meshing contact with an adjacent wheel, at least one of said wheels being driven, inlet and outlet openings positioned adjacent the points at which the gear wheels separate and mesh respectively and means projecting into the inlet opening and positioned adjacent the point at which the gear wheels separate to permit an additive to be injected into said inlet opening, said means being a hollow rod having an end portion shaped to conform to the gear wheels to the point at which they separate, the inlet opening for said additive being through the tip of said end portion where the gear wheels separate.

4,093,408

POSITIVE CAM TYPE COMPRESSOR

Yoshichika Yamaguchi, 101 Toyobafuji, Toyoyama-Chou, Nishikasugai-District, Aichi Prefecture, Japan

Filed Dec. 3, 1976, Ser. No. 747,086
Int. Cl.[2] F01C *1/00, 19/00, 21/04*
U.S. Cl. 418—92 5 Claims



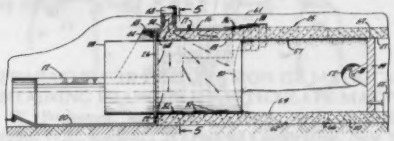
1. A positive cam type compressor comprising a cylinder having opposite ends, valve plates at each of the ends of the cylinder, front and rear plate casings on said valve plates defining respective compartments, a positive cam mounted in said cylinder to form chambers on opposite sides of the cam, means for rotating said cam, said valve plates having suction and exhaust valve openings for respective feed and discharge of fluid to and from said chambers, at least one isolator plate slidably supported by said cylinder, plate casings, and valve plates, said cam being slidably engaged with said isolator plate to produce successive suction and compression stages in said chambers and reciprocal movement of said plate into and out of said compartments as said cam undergoes rotation, a tank for lubricating fluid, said plate casings having small holes in opposite end walls thereof communicating with said tank, said isolator plate being provided with a network of lubricating channels which open at the surface of the isolator plate for facing regions to be lubricated, said isolator plate having opposite ends with small ports thereat leading to said network of channels, said ports facing said end walls of the plate casings for conveying lubricating fluid to and from said network as the isolator plate undergoes reciprocal movement, wherein said isolator plate constitutes a piston which penetrates into said compartments respectively and produces pressure therein to force the lubricating fluid into said network via said ports and withdraws from said compartments respectively and produces suction therein producing return of lubricating fluid thereto.

4,093,409

IN SITU CONCRETE PIPE FORMING MACHINE

Thomas W. Barber, El Toro, and Miles W. Proctor, Santa Ana, both of Calif., assignors to Donovan Construction Company, Irvine, Calif.

Continuation of Ser. No. 590,257, Jun. 25, 1975, abandoned.
This application Jan. 24, 1977, Ser. No. 762,063
Int. Cl.[2] B28B *13/02*
U.S. Cl. 425—59 19 Claims



1. An apparatus for forming in place continuous concrete pipe in an open trench, said apparatus comprising:
- an interior forming member;
- an exterior forming member;
- means connecting said exterior forming member to said interior forming member in a spaced relation with respect to each other to define a space therebetween, said space being open at its rear end and closed at its forward end;
- a concrete pump;
- means connecting said concrete pump to said space for supplying concrete under pressure into said space between said interior and exterior forming members, said concrete reacting against the closed forward end of said space for moving said forming members forward; and
- an inflatable support bag located and moving behind said interior forming member to support said pipe as said forming members move forward.

4,093,410

DITCH PAVING TOOL

Charles P. Miller, McHenry, Ill., assignor to Miller Formless Co., Inc., McHenry, Ill.

Filed Jan. 21, 1977, Ser. No. 761,272
Int. Cl.[2] 404 *104;* E02B *11/02*
U.S. Cl. 425—59 6 Claims

1. A ditch paving tool adapted to form a continuous layer of concrete along the sloping wall of a graded ditch upon being propelled therealong by a prime mover comprising:
- a frame assembly including a pair of horizontal members supporting thereunder a framework angularly oriented with respect to said horizontal members;
- said framework being disposable in a working relationship with the sloping wall of said ditch;
- pivot means on said frame assembly for attaching to said prime mover for pivotal movement of said frame assembly therefrom on a generally horizontal axis;
- at least a pair of upright support members extending from said frame assembly, and spaced laterally outward from

said pivot means and having their upper ends above said horizontal axis;

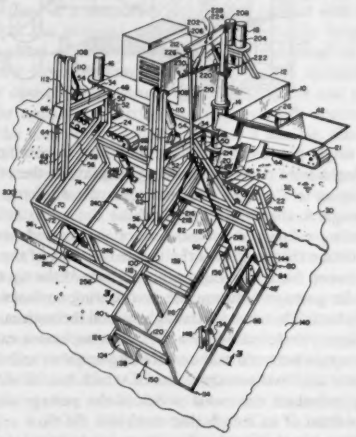
a pair of front and rear guide means carried by the forward end of said frame assembly;

said pair of guide means being disposed and generally transverse said frame assembly;

the front guide means having a forwardly extending flange along its lower edge;

the rear guide means having a rearwardly extending flange along its lower edge;

a screed assembly carried by said pair of guide means and supported in sliding relationship on said flanges;



said screed assembly including enclosing substantially vertical side walls and an end wall adapted to retain said concrete for distribution in a continuous layer along said sloping wall;

power means connected between said pair of guide means and said screed assembly to extend and retract said screed assembly in relation to said pair of guide means whereby the width of said layer is controlled; and

means operatively connected to said upright support members to pivot said guide means about said pivot means to maintain said lower edges in substantially parallel spaced relationship with said sloping side.

4,093,411

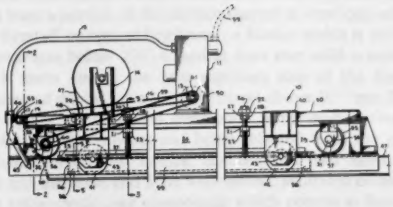
APPARATUS FOR APPLYING FOAMED MATERIAL IN-PLACE TO SURFACES

Jimmy D. Lee, 6821 Piccadilly, Houston, Tex. 77017

Filed Dec. 29, 1975, Ser. No. 644,563

Int. Cl.² B29D *27/04*

U.S. Cl. 425—64 **10 Claims**



1. An apparatus for applying a foamed polymeric material in-place to a surface having an independent spacing element thereon comprising:

a framework adapted to move adjacent to the surface to which the foam is to be applied,

spacing means attached to said framework along only one side thereof for spacing said framework away from the surface to which said foam is to be applied, said framework being operatively associated with such an independent spacing element to slidably contact such an independent spacing element along the side of said framework opposite to said spacing means,

a fixed pressure plate adjustably mounted in said framework, substantially parallel to the surface to which the foam is to be applied, and adapted to cover a portion of the foamed material applied to the surface, said pressure plate being within a continuous belt mounted to said framework and which is a rolling surface, and

foam dispensing means, operably associated with one side of said framework and positioned to deliver a foamed material in proximity to the surface to which the foam is to be applied, and said pressure plate.

4,093,412

COOLING THERMOPLASTICS TUBES

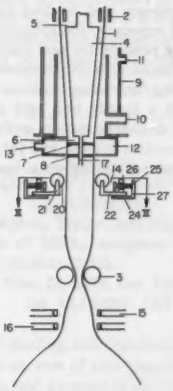
John Brian Davis; Derek Skilling, and Nigel Edwin Wrigley, all of Dumfries, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 480,273, Jun. 17, 1974, Pat. No. 3,993,723. This application Sep. 23, 1976, Ser. No. 725,686

Claims priority, application United Kingdom, Jul. 2, 1973, 31404/73

Int. Cl.² B29D *23/04*

U.S. Cl. 425—71 **8 Claims**



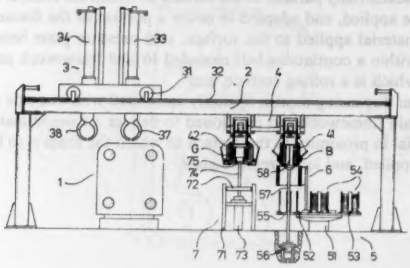
1. An apparatus for cooling an extruded tube of thermoplastic material comprising an annular orifice for extrusion of such a tube, a cooling surface downstream of said annular orifice, means downstream of said orifice for withdrawing such a tube, in the direction of extrusion, in heat-transfer relationship with said cooling surface, means operatively associated with said cooling surface for providing a sheath of a heat-transfer fluid between, and in contact with, such a tube and said cooling surface, and means between said withdrawing means and the downstream extremity of said cooling surface for displacing the whole tube in the same direction transversely of the direction of extrusion to decrease the thickness of the fluid sheath between at least a selected area of such a tube and the cooling surface.

4,093,413

AUTOMATED APPARATUS FOR MOLDING OR DIE CASTING

Wolfgang Schöllhorn, and Urban Ehret, both of Zuzwil, Switzerland, assignors to Gebruder Buhler AG, Switzerland

Filed Jun. 1, 1977, Ser. No. 802,313
Claims priority, application Switzerland, Jun. 9, 1976, 7238/76
Int. Cl.² B29C 6/00, 7/00
U.S. Cl. 425—110 26 Claims



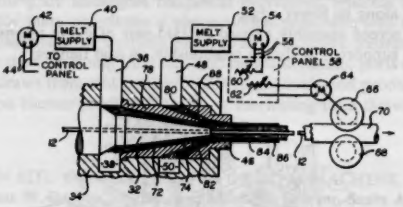
1. Apparatus for the automated manufacture, in repetitive cycles, of composites constituted by apertured composite articles having the aperture in a prefabricated insert thereof, said apparatus comprising, in combination, a mold-forming machine operable to apply molten material about said insert, by a molding operation, to form said composite; plural clamping mandrels operable to be clamped in said apertures to constitute, temporarily, "mandrel-with-insert" and "mandrel-with-composite" combinations; a discharge station for discharging composites from said mandrels; a charging station for charging said mandrels with said inserts; and a loading system with holding means, including holders for holding said mandrels, and with conveying means; said loading system repetitively carrying out, in timed sequence, the following operations: (1) at a loading/unloading position for said machine, taking hold, using a holder, of a "mandrel-with-composite" from said machine; (2) at said loading/unloading position, loading in "mandrel-with-insert" from a holder into said machine; (3) at a set-off position at said discharge station, setting-off at least one composite from a respective holder; and (4) at a take-up position at said charging station, taking-up at least one insert with a respective holder.

4,093,414

SINGLE DIE CO-EXTRUSION APPARATUS FOR INSULATION

Edward Stanley Swiatovy, Jr., Bonham, Tex., assignor to General Cable Corporation, Greenwich, Conn.

Filed Sep. 16, 1976, Ser. No. 723,783
Int. Cl.² B29F 3/10
U.S. Cl. 425—113 12 Claims



1. A single die for co-extrusion including in combination a tip having a wire passage extending lengthwise therethrough and tapering to a smaller diameter toward a discharge end of the passage at the forward end of the tip, an extrusion die surrounding a forward end portion of the tip and having an inside surface that confronts the tapered surface of the tip and that is spaced from the confronting surface of the tip to leave an annular passage between the confronting surfaces for the flow of plastic electrical insulating material through said annular passage, characterized by a melt flow separator extending into the space between said confronting surfaces and dividing said space into two passages, one of which has its sides converging to reduce the radial width of the passage along the entire portion of its length that confronts the flow separator, for different materials for forming superimposed layers of insulation, the melt flow separator extending for a portion and only a portion of the length of said annular passage, the melt flow separator terminating at its forward end at a location spaced back from the discharge end of the tip so that the separator cannot serve as an extrusion die for said tip, passages in communication with said two passages for supplying different insulating material to the upstream ends of each of said two passages on the different sides of the melt flow separator, and the extrusion die having a tapered passage therein extending beyond the tip and in which the superimposed layers of insulation are sized before discharge from the die.

4,093,415

TRANSFER PRINTING PROCESS FOR HYDROPHILIC, SYNTHETIC FIBRE MATERIAL OR MIXTURES OF HYDROPHILIC AND SYNTHETIC FIBRE MATERIAL

Raymond Defago, Riehen, and Zdenek Koci, Binningen, both of Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

Filed Jul. 8, 1975, Ser. No. 594,077

Claims priority, applications Switzerland, Jul. 12, 1974, 9638/74

Int. Cl.[2] D06P *5/00*; C09D *11/00*

U.S. Cl. 8—2.5 A 22 Claims

1. In a transfer printing process for the dyeing or optical brightening of hydrophilic fiber material, synthetic fiber material or mixtures thereof which comprises bringing a treated and dried surface of a temporary carrier into contact with the dry surface of the material to be dyed or optically brightened, applying heat sufficient to effect transfer of dyestuff or optical brightener from the temporary carrier to the material to be dyed or optically brightened, and separating the said material from the temporary carrier, the improvement according to which the temporary carrier comprises a flexible, dimensionally stable, heat stable, sheet-like base having on at least a portion of the surface thereof at least one sublimable dyestuff or optical brightener, a binder which is stable at temperatures below 230° C and at least one solid compound which melts during the heat exposure step of the transfer process and which has a vapor pressure above 10^{-5} mm Hg at 150 to 250° C, said solid compound being inert during the transfer printing process and being selected from the group consisting of amides, imides, unsubstituted and substituted ureas and thioureas and 5- or 6- membered saturated or unsaturated heterocyclic ring compound which possess at least one of the groups or atoms N, S, O, NH, CO, =CH or CH_2 as members and which compound is unsubstituted or substituted by a member from the group of alkyl (C_1 - C_4), OH, NH_2, hydroxyalkyl (C_1 - C_3) and halogen.

17. In a printing ink composition useful in the printing of temporary carriers for use in the transfer printing process, said composition comprising water, organic solvent or mixtures thereof having dissolved or dispersed therein at least one sublimable dyestuff or optical brightener and a binder which is stable below 230° C.

the improvement wherein the composition contains at least one solid compound which melts during the heat exposure step of the transfer printing process and which has a vapor pressure above 10^{-5} mm Hg at temperatures of 150° to 250° C, said solid compound being inert during the transfer printing process and being selected from the group consisting of amides, imides, unsubstituted and substituted ureas and thioureas and 5- or 6-membered saturated or unsaturated heterocyclic ring compounds which possess at least one of the groups or atoms N, S, O, NH, CO, =CH or CH_2 as members and which compound is unsubstituted or substituted by a member from the group of alkyl (C_1 - C_4), OH, NH_2, hydroxyalkyl (C_1 - C_3) and halogen.

18. In a temporary carrier for use in the transfer printing process the improvement wherein said carrier comprises a flexible, dimensionally stable, heat stable sheet-like base having on at least a portion of the surface thereof at least one sublimable dyestuff or optical brightener, a binder which is stable at temperatures below 230° C and at least one solid compound which melts during the heat exposure step of the transfer process and which has a vapor pressure above 10^{-5} mm Hg at 150° to 250° C, said solid compound being inert during the transfer printing process and being selected from the group consisting of amides, imides, unsubstituted and substituted ureas and thioureas and 5- or 6-membered saturated or unsaturated heterocyclic ring compounds which possess at least one of the groups or atoms N, S, NH, CO, =CH or CH_2 as members and which compound is unsubstituted or substituted by a member from the group of alkyl (C_1 - C_4), OH, NH_2, hydroxyalkyl (C_1 - C_3) and halogen.

4,093,416

PROCESS FOR PRINTING CARPETS

Björn Sigurd, Rump, Geneva, Switzerland, and Philippe Jean Dereux, St-Julien-en-Genevois, France, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 2, 1976, Ser. No. 646,026

Int. Cl.[2] D06P *1/20, 3/04, 7/00*

U.S. Cl. 8—2.5 A 17 Claims

1. In a dry heat-transfer printing process for the printing of carpet yarns wherein web or warp of yarns is brought into contact with a temporary support carrying a vapor transferable dyestuff or dyestuffs and heat is applied to achieve the vapor transfer of the dyestuff or dyestuffs from the temporary support onto the web or warp of yarns, said vapor transfer being carried out prior to introducing said yarns into a machine for weaving, knitting or for attachment of the yarns to a base to form a carpet, the improvement according to which, following the vapor transfer and prior to separation of the temporary support from the yarns, the yarns and temporary support are wound onto a beam.

4,093,417

METHOD FOR PROCESSING TEXTILE MATERIAL

Karl Hans Heinlein, Alte Bahnaofstrasse 33, and Joachim Busch, Poststrasse 6, both of D-649 Schluechtern, Germany

Filed Jul. 29, 1975, Ser. No. 600,049

Claims priority, application Germany, Jun. 1, 1974, 2437173; Mar. 4, 1975, 2509381

Int. Cl.[2] B08B *3/00*

U.S. Cl. 8—137 20 Claims

1. Method for washing textile material consisting of at least one prewash and main wash cycle and one or more rinse cycles, where a phosphate-free alkaline wash liquor is used in the main wash cycle, characterized in that a prewash detergent with surface-active substances acting in the acid range is used in acid wash solution in the prewash cycle, and that carbonate incrustations whose composition is such that they dissolve in the acid wash solution of the prewash cycle remaining on the textile material to be treated are formed in the main wash cycle.

4,093,418

METHOD OF SPOTTING GARMENTS TO BE LAUNDERED

John William Compton, Taylor, and Stephen Ellis Eisenstein, Southfield, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 23, 1977, Ser. No. 780,557

Int. Cl.[2] D06L *1/00*

U.S. Cl. 8—142 4 Claims

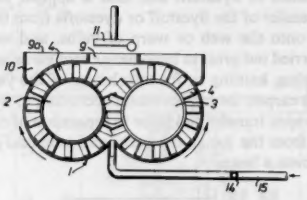
1. A method of spotting and laundering a garment containing organic soil in an area of said garment, said method comprising applying to said garment in the vicinity of said organic soil a composition which consists essentially of a solution of (1) about 10 weight percent or more of nonionic surfactant produced by reacting a mixture of fatty alcohols containing 10 to 18 carbon atoms (with the proviso that the proportions of such alcohols which is attributable to alcohols containing 17 or more carbon atoms is limited to about 20 percent by weight) with mixed lower-alkylene oxides selected from the group consisting of ethylene oxide and propylene oxide to such an extent as to have the mixed oxides comprise about 57 to 68 weight percent of the total fatty alcohols plus alkylene oxides used, with the proportion of ethylene oxide in the mixed oxides used being about 50 to 70 percent, and (2) an isoparaffinic solvent made of a mixture of isoparaffins containing an average of about 11 to 14 carbon atoms, and then laundering said garment.

4,093,419

DEVICE FOR IRRADIATING LIQUID AND PASTY SUBSTANCES

Manfred Tauber, Holm, and Dieter Heuer, Uetersen, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Filed Oct. 15, 1976, Ser. No. 732,893
Claims priority, application Germany, Oct. 22, 1975, 2547261
Int. Cl.[2] A61L 3/00; G01N 23/12
U.S. Cl. 21—102 R 6 Claims



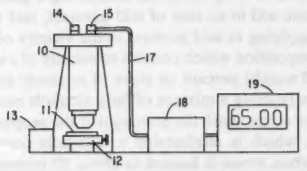
1. A device for irradiating liquid and pasty substance with high energy electrons in order to pasteurize or sterilize the irradiated substances and to also enrich them with one or more additives, particularly with gases, comprising, a horizontally disposed housing, a pair of cylindrical circulation members rotatably mounted in said housing in parallel relationship and being rotatable in opposite directions and having radially extending helically arranged blades, said housing having walls which extend in the axial direction of said circulation members and are closely conformable to the annular paths followed by the peripheries of said blades during rotation thereof, said housing having the shape of a solid figure eight formed of two tubes connected together and having a front side with an inlet for feeding the substance to be irradiated and having an opposite rear side with an outlet for discharging the irradiated substances, said housing further being provided with a plurality of openings between said inlet and said outlet for the introduction of additives and having a top with an irradiation opening between the axes of said circulation members, and electron beam radiation means disposed over said irradiation opening for directing a sweeping electron beam over said irradiation opening.

4,093,420

MINERAL PROSPECTING BY ORGANIC DIAGENESIS

John F. Grayson, Tulsa, Okla., and Peter K. H. Groth, Denver, Colo., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 4, 1976, Ser. No. 692,825
Int. Cl.[2] G01N 33/24
U.S. Cl. 23—230 EP 6 Claims



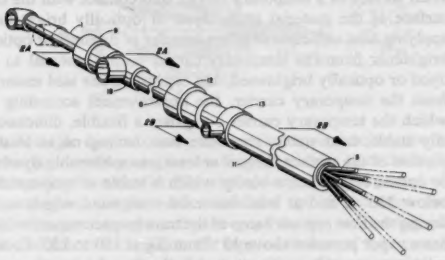
1. A method of prospecting comprising the following steps:
(a) removing palynomorphs from geological samples collected from a plurality of stations separated by a considerable distance in a region and,
(b) measuring a light characteristic due to transmission of light through a selected part of each of a plurality of said palynomorphs recovered from each sample to determine an average value thereof, whereby the average values from step (b) may be mapped against the location of said plurality of stations to produce anomalies characteristic of the subsurface below said stations.

4,093,421

APPARATUS FOR PRODUCING CARBON BLACK

Norman M. Jerkins, Rockport, Tex., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 709,814, Jul. 29, 1976, abandoned.
This application Sep. 1, 1977, Ser. No. 830,276
Int. Cl.[2] C09C 1/48; F23C 5/06
U.S. Cl. 23—259.5 5 Claims

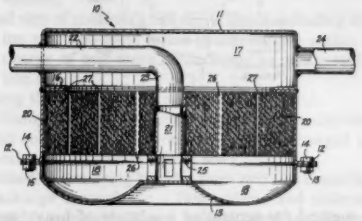


1. In a furnace-type reactor for the production of abrasion-resistant grades of rubber-reinforcing carbon black, said furnace having a tubular combustion chamber for effecting the burning of gaseous fuel therein whose diameter is substantially larger than the length thereof and whose downstream end is in open communication with an elongated axially aligned tubular reaction zone having a diameter substantially smaller than that of said combustion chamber, and means for injecting a normally liquid carbon black producing feedstock, centrally positioned within said chamber and adapted to introduce the feedstock axially into said reaction zone; the improvement wherein said feedstock injection means comprises:
a pipe shroud member fixedly and centrally positioned with respect to the upstream closure end of said combustion chamber and in axial alignment therewith, said shroud member having an upstream and downstream closure end, the latter freely accommodating the passage of the metallic feedstock supply tubes as hereinafter defined;
a feedstock suppy pipe concentrically disposed within said shroud member adapted to be longitudinally extended in the downstream direction and retracted in the upstream direction and whose upstream end projects beyond the upstream closure end of the pipe shroud member;
a cylindrical manifold rigidly attached to and in open communication with the downstream end of said feedstock suppy pipe and the header end of which is provided with a centrally located circular port and a plurality of like ports circumferentially disposed thereabout;
a metallic feedstock supply tube rigidly connected to and in axial alignment with said centrally located circular port and whose discharge end is about flush with the face of the pipe shroud member downstream closure end upon retraction of said feed stock supply pipe to its upstream excursion limit; and
a metallic feedstock supply tube of approximately the length of said centrally disposed feedstock supply tube rigidly connected to each of said circumferentially disposed header ports and permanently angularly preformed so that the discharg ends thereof assume an expanded circular pattern contiguous to and within the periphery of the opening of said reaction zone upon positioning same downstream of said pipe shroud member downstream closure end by extending said feed stock supply pipe beyond said upstream excursion limit thereof.

4,093,422
AUTOMOTIVE EXHAUST SYSTEM USING FILTER CONTAINING CALCIUM CARBONATE COATING

Paul O. Hain, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 1, 1976, Ser. No. 691,479
Int. Cl.[2] B01J 1/22; B01D 35/18
U.S. Cl. 23—284 8 Claims

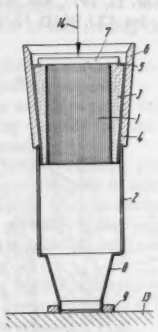


1. In an exhaust system for an internal combustion engine, the improvement comprising a filter contained in a container and interposed in the exhaust line, said filter containing paper formed into a gas filter in which the plane of the paper is parallel to the movement of the exhaust gases, said paper being coated with finely divided particles of calcium carbonate, said paper being ablative under the conditions encountered in said exhaust system, said calcium carbonate constituting at least 85% of the weight of pigments and fillers in the coating, and the proportion of binder in the coating not exceeding 20% of the total weight of pigments and fillers, and said filter being positioned so that when the exhaust gases are passed through the filter, the coated paper can fall away from the filter where it is initially contacted by said exhaust gases.

4,093,423
CATALYTIC DEVICE FOR THE CATALYTIC PURIFICATION OF EXHAUST GASES

Joachim Neumann, Stockheim, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 3, 1973, Ser. No. 403,270
Claims priority, application Germany, Dec. 7, 1972, 2259817; Oct. 3, 1972, 2248442; Apr. 18, 1973, 2319663
Int. Cl.[2] B01J 8/03, 35/04; F01N 3/15; B21D 53/00
U.S. Cl. 23—288 FC 8 Claims



1. A method of supporting a ceramic monolithic element in a generally tubular metal catalytic converter housing comprising the steps of: wrapping a compressible, resilient material around the periphery of a monolithic catalyst element; placing at least one self-supporting, thin metal liner member around said wrapper of resilient material, the combination of said monolithic element, said resilient material wrapper and said liner member having a diameter in an uncompressed state greater than the internal diameter of said housing; imposing an external compressive force about said liner member around its periphery to compress said wrapper of resilient material and to reduce the circumference of the liner member to a dimension less than the internal circumference of the converter housing; axially inserting said compressed combination of said liner member, said wrapper of resilient material and said monolithic element into said tubular housing and removing said external compressive force.

3. In a catalytic converter for treating exhaust gases having a metal housing containing gas inlet and outlet ports and a catalyst coated, axially channeled monolithic ceramic element positioned within said housing, the improvement comprising a wrapper of compressible, resilient material wrapped around said ceramic element, and extending axially for at least a portion of the length of said element, said wrapper being maintained in a partially compressed state as compared to either its free or its fully compressed state, within the walls of a tubular center portion of said housing and also comprising at least one metal liner member shaped to conform generally to and within the walls of the tubular center portion, the said liner member having non-joined longitudinal side edges which permit the diameter of the liner member to be varied, said liner member being positioned in surrounding relation to said wrapper and in contact with said wrapper so as to partially compress said wrapper and to space said wrapper from the walls of said tubular center portion of said metal housing, the resiliency of said wrapper causing said liner member to be forced outwardly to the maximum diametrical extent permitted by the constraint imposed by the center portion of the metal housing.

4,093,424
THERMOGENIC COMPOSITIONS

Risaburo Yoshida; Keisuke Kaiho; Yusaku Ide, and Takeshi Hirose, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co,, Ltd., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,715
Claims priority, application Japan, Mar. 9, 1976, 51-24700; Apr. 13, 1976, 51-40867; Jun. 15, 1976, 51-69297; Jun. 15, 1976, 51-69298; Jul. 21, 1976, 51-86051; Dec. 9, 1976, 51-147124
Int. Cl.[2] F24J 1/00, 3/00; C09K 3/18
U.S. Cl. 44—3 C 7 Claims

1. A thermogenic composition comprising (A) at least one compound selected from the group consisting of alkali metal sulphides, polysulphides, hydrosulphides, hydrates thereof and mixtures thereof and (B) at least one compound selected from the group consisting of (1) carbonaceous material, (2) iron carbide, (3) activated clay, (4) iron, nickel and cobalt sulphates and hydrates thereof and (5) potassium salt of anthraquinone sulphonate.

4,093,425
PROCESS FOR PREPARING COAL BRIQUETTES FOR COKE AND APPARATUS FOR THE PROCESS

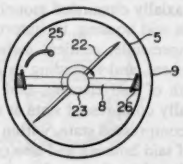
Eimi Araki, Kyoto; Takeo Sakai; Seizaburo Takai, both of Tokyo, and Sekiro Komori, Fukuyama, all of Japan, assignors to Keihan Rentan Kogyo Co., Ltd., Japan

Filed Oct. 29, 1976, Ser. No. 737,021
Claims priority, application Japan, Nov. 1, 1975, 50-131678
Int. Cl.[2] C10L 5/00, 5/22; B30B 11/00
U.S. Cl. 44—10 F 13 Claims

1. A process for preparing a coal briquette by pulverizing a starting coal followed by adding a caking agent and then molding the resulting mixture, which comprises introducing coal into a tightly closed vessel equipped with a high speed rotating blade, pulverizing the coal, while water content of the coal is left as it is, raising the temperature of coal by utilizing frictional heat generated during the pulverization, to a temperature above the melting point of said caking agent maintaining the system pressure at a predetermined value by regulating the water content of the pulverized coal, adding said caking agent to the pulverized coal while the coal is kept at said temperature

above the melting point of the caking agent, throughly mixing and kneading the caking agent with the pulverized coal and sufficiently spreading it over the pulverized coal and subsequently removing the coal from said tightly closed vessel and briquetting the coal.

12. A tightly closed type of kneader for pulverizing a starting coal for coal briquette and kneading the pulverized coal with caking agent which comprises a propeller type inclined lower stirring blade and a U type stirring upper blade near the



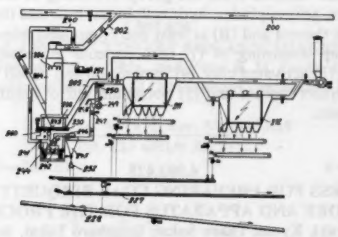
bottom where both the blades are fixed coaxially or to the same shaft and driven externally, an inlet for the starting coal and an outlet for product both of which can be opened, closed or tightly shut, a coal collecting blade having a sectoral cross section facing the direction of rotation of the coal and fixed inside of the U-type rotating blade, an automatically controlled external heating device and a pressure controlling device which can function also as a discharge valve for excessive steam pressure, and a water-supply pipe.

4,093,426

METHOD OF AND APPARATUS FOR THE LIQUID CONTACT OF DUST FROM A HOT-GAS STREAM AND DRYING SLUDGE

Juan Cantalapiedra Benjumea, Madrid, Spain, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 16, 1977, Ser. No. 807,329
Claims priority, application Spain, Jun. 18, 1976, 448,984
Int. Cl.² B03C *1/00*
U.S. Cl. 55—8 **10 Claims**



1. In a method for the removal of solids from a hot-gas stream entraining particles of said solids wherein said hot-gas stream is cooled, treated with a liquid with settling of particles therefrom, and thereafter subjected to electrostatic precipitation, the improvement which comprises:

separating settled particles from the gas stream from which the particles settle;

branching a portion of a main stream of the hot-gas stream from the remainder of the main stream prior to the cooling thereof;

contacting the separated settled particles with the branched portion of said hot-gas stream to cool the branched portion and dry the separated settled particles; and

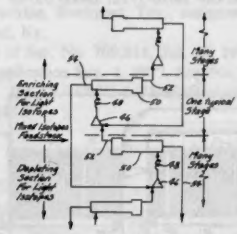
thereafter combining said cooled portion with the remainder of the main stream prior to electrostatic precipitation.

4,093,427

METHOD FOR SEPARATING ISOTOPES

Ralph F. Schlenker, R.R. #4, Indianola, Iowa 50125

Filed Jan. 23, 1975, Ser. No. 543,232
Int. Cl.² B01D *57/00*
U.S. Cl. 55—17 **5 Claims**



1. A method for separating a mixture of heavy and light isotopes comprising:

introducing a gaseous feed stock mixture containing light and heavy isotopes under sufficient pressure and temperature into an elongated cylindrical vortex tube in a circumferential fashion so as to impart a swirling action of said mixture within said tube around the longitudinal axis thereof which separates said mixture into a warmer outer, radial portion and a cooler inner, radial portion;

drawing off said outer radial portion of said swirling mixture which comprises about 60% of the feed stock mixture adjacent the cylindrical walls of said tube through an outer opening spaced radially outwardly from the longitudinal axis of said tube;

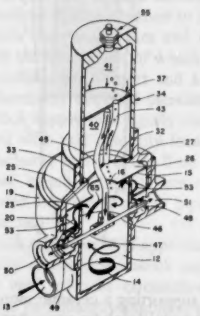
drawing off the inner radial portion of said whirling mixture which comprises about 40% of the gaseous feed stock mixture through an axial outlet located approximately along the longitudinal axis of said tube, said inner radial portion exiting from said axial outlet being enriched with heavy isotopes and said outer radial portion exiting from said outer opening being enriched in light isotopes.

4,093,428

GAS/LIQUID SEPARATOR

Emery C. Swogger, Arlington, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1977, Ser. No. 786,909
Int. Cl.² B01D *19/00*
U.S. Cl. 55—52 **11 Claims**



1. A method of separating liquid from gas bubbles entrained therein comprising:

creating a vortex of said liquid so that more dense substantially bubble-free liquid will collect in the periphery

thereof and less dense bubble-containing liquid will collect in the center thereof,

said step of creating a vortex including initially directing liquid tangentially into a circular chamber;

recovering said more dense liquid by peripheral discharge and collecting said less dense liquid by aspiration effect from said vortex,

said step of recovering more dense liquid including changing circular flow of exiting liquid into radial flow thereof,

said step of collecting less dense liquid including discharging said less dense liquid symmetrically within the discharge of said more dense liquid to create said aspiration effect;

venting the bubbles from said collected liquid;

combining said liquid recovered by peripheral discharge and said collected liquid in an outlet flow arranged so as to create said aspiration effect; and

additionally removing bubbles from said less dense liquid by discharge thereof into a first volume and collecting the liquid in a second volume by peripheral settling from said first volume,

said step of recovering more dense liquid further including additionally baffling said peripherally discharged liquid so as to form radially outward movement thereof prior to said liquid entering the outlet of the separating device.

2. A gas and liquid separator for separating entrained gases from a liquid such as hydraulic fluid under extreme starting and operating conditions comprising:

a container having an inlet chamber and inlet means for directing liquid entering said chamber around the circumference thereof so as to produce a swirling motion therein thereby creating a centrifugal force action which causes heavier liquid to move to the wall of the chamber and liquid having gas entrained therein to be forced toward the center of the chamber so as to create a vortex in the liquid directed thereinto;

a separating chamber contiguous to said inlet chamber for initially separating larger gas bubbles from said liquid;

an annular chamber disposed about said separating chamber and a circumferential slot in said separating chamber permitting overflow of more dense liquid into said annular chamber so that the more dense substantially gas-free liquid may be discharged therefrom;

a settling chamber remote from said separating chamber and means for directing the liquid not discharged from said separating chamber and containing smaller gas bubbles into said settling chamber;

vent means connected to said settling chamber for venting gas therefrom,

said settling chamber partitioned into at least upper and lower communicating volumes;

means for collecting and conveying liquid not discharged from said separating chamber through said lower volume to said upper volume;

means including a baffle permitting peripheral settling of liquid from said upper volume to said lower volume for centrally concentrating said not discharged liquid;

conduit means for centrally discharging liquid from said lower volume at a position adjacent said means permitting peripheral settling;

means for combining liquid discharged from said separating chamber and said lower volume so as to augment flow of liquid through said separator,

said combining means including a restricted outlet in said container and said annular chamber communicating with and discharging liquid into said restricted outlet in such a relation to the discharge of liquid thereinto from said volume as to create an aspiration effect inducing circulation into and out of said upper volume;

and

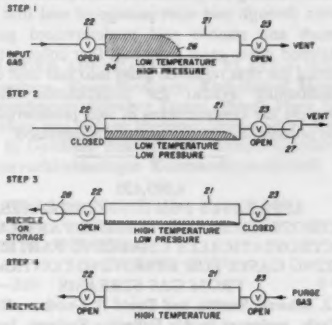
radially disposed baffles in said annular chamber for changing circular flow of liquid to radial flow thereof.

4,093,429

GAS SEPARATION SYSTEM

Manfred Siegler, San Jose, and Ted Lee Wong, Sunnyvale, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 19, 1975, Ser. No. 642,460
Int. Cl.² B01D *51/00, 53/04*
U.S. Cl. 55—58 **10 Claims**



1. In a processing system for processing a stream of a gas mixture including a relatively small portion of predetermined gas mixed with other gases. a process for removing said predetermined gas from said gas mixture and concentrating said predetermined gas comprising the steps of:

(1) providing a gas preconditioning system having an inlet and an outlet and including means for removing selected gases from said gas mixture;

(2) directing said gas mixture into said inlet of said preconditioning system to thereby provide a preconditioned gas mixture at said outlet of said preconditioning system;

(3) providing a gas separation system including first and second adsorber columns each including a bed of adsorbent having high selectivity for said predetermined gas in a container having inlet and outlet passages, said preconditioning system having a gas handling capacity which is multiple of the gas processing capacity of said separation system;

(4) directing all but a predetermined portion of said preconditioned gas mixture from said outlet of said preconditioning system to the inlet thereof for recirculation therethrough;

(5) directing said predetermined portion of said preconditioned gas mixture from said outlet of said preconditioning system into said inlet passage of said first column of said separation system and into the first column bed thereof while said column is at a low temperature and a high pressure favorable for adsorption of said predetermined gas on said adsorbent whereby an adsorbate of said predetermined gas and co-adsorbed other gases is adsorbed only on an upstream portion less than the full length of said first column bed while the remainder of said other gases free of said predetermined gas are exhausted through said outlet passage of said first column and vented from said processing system;

(6) directing said predetermined portion of said preconditioned gas mixture into said inlet passage of said second column and into the second column bed in accordance with the conditions of said step (5) when said upstream portion of said first column bed becomes saturated;

(7) closing said inlet passage of said first column when said upstream portion of said first column bed becomes saturated and reducing the pressure therein from said high pressure to a low pressure favorable for desorption of said adsorbate from said adsorbent by pump-down through said outlet passage of said first column for removing from said first column bed and venting from said processing

system a portion of said co-adsorbed other gases, and terminating said pump-down short of breakthrough of said predetermined gas from said bed whereby the vented gases are free of said predetermined gas;

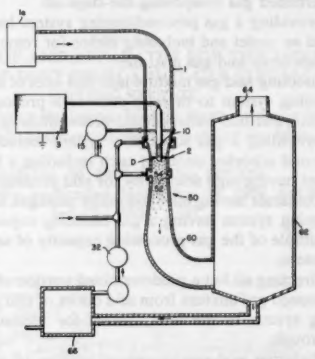
(8) closing said outlet passage of said first column and increasing the temperature of said first column bed above said low temperature to a high temperature favorable for desorption of said predetermined gas from said absorbent while reducing the pressure in said first column by pump-down through said inlet passage of said first column to desorb and remove said predetermined gas and co-adsorbed other gases from said first column bed and directing the thus removed gases into said inlet of said preconditioning system for recirculation therethrough whereby the concentration of said predetermined gas in said preconditioned gas mixture is increased.

4,093,430

APPARATUS FOR IONIZING GASES, ELECTROSTATICALLY CHARGING PARTICLES, AND ELECTROSTATICALLY CHARGING PARTICLES OR IONIZING GASES FOR REMOVING CONTAMINANTS FROM GAS STREAMS

James J. Schwab, Seattle, and David B. Goodson, Renton, both of Wash., assignors to Air Pollution Systems, Incorporated, Kent, Wash.

Division of Ser. No. 498,409, Aug. 19, 1974, abandoned. This application May 28, 1976, Ser. No. 690,948
Int. Cl.² B03C 3/41
U.S. Cl. 55—107 **35 Claims**



1. An apparatus for removing contaminants from a gas, comprising:

a tubular outer electrode adapted to conduct said gas therethrough;

a generally planar inner electrode having a perimeter generally corresponding to the shape of said outer electrode, said inner electrode being positioned within said outer electrode and defining an electrode gap therebetween, said inner electrode having a smoothly curved peripheral surface converging outwardly from the center of said electrode when viewed in axial cross section said inner electrode being the sole corona current emitting structure within a sufficient distance from said inner electrode to allow an axial wedge-shaped expansion of the field to the outer electrode;

means for applying a high voltage across said electrodes for creating a corona discharge high intensity electrostatic field within said electrode gap;

means for cleaning the surface of said outer electrode;

means for moving said gas in a stream axially through said electrode gap thereby charging contaminants in said gas; and

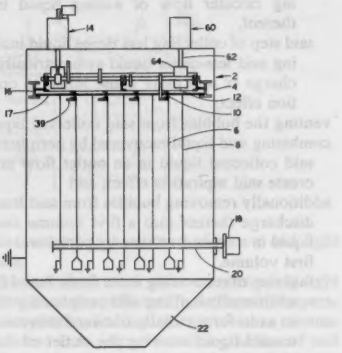
means for collecting said charged contaminants.

4,093,431

RAPPING ASSEMBLY AND ELECTRODE SUPPORTS FOR ELECTROSTATIC PRECIPITATORS

Alfred Frauenfelder, Zollikerberg, Switzerland, assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Dec. 13, 1976, Ser. No. 749,674
Int. Cl.² B03C 3/76
U.S. Cl. 55—112 **7 Claims**



1. In combination with an electrostatic precipitator having a housing with a flow-through inlet and a flow-through outlet and a plurality of discharge and collecting electrodes disposed therein defining an electrostatic field therebetween, said housing including an opening in the upper portion thereof with a rapping assembly extending therethrough, said rapping assembly for said discharge electrodes comprising:

an electrically insulated cover means covering said opening;

a vertically extending reciprocating support means having an upper end extending through said cover, insulating means insulating said reciprocating support means, the lower end of said support means having a pin wheel drive means mounted thereon;

driving means driving said reciprocating support means;

a vertically extending stationary support tube encircling said vertically extending reciprocating means attached to said insulated cover means at its upper end and having electrode carrying means mounted onto its lower end;

said electrode carrying means having a plurality of said discharge electrodes attached thereto and at least one rapper receiving means mounted onto said electrode carrying means;

said electrode carrying means including rapper shaft support means thereon supporting a horizontally extending rapper shaft, said rapper shaft including at least one rapper thereon, said rapper being in alignment with and received by said rapper receiving means, said rapper shaft including a pin wheel therein in alignment with and driven by said pin wheel drive means whereby said rapper shaft is rotatable at a preselected rate.

4,093,432

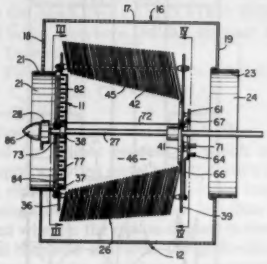
ELECTROSTATIC PRECIPITATOR

Willard K. Ahlrich, 2227 Pine Lake Rd. NW., Stuart, Fla. 33494

Continuation-in-part of Ser. No. 573,570, May 1, 1975, Pat. No. 4,018,578. This application Sep. 3, 1976, Ser. No. 720,219
Int. Cl.² B03C 3/00
U.S. Cl. 55—138 **17 Claims**

1. In an electrostatic precipitator having a plurality of annular, axially spaced apart, parallel collector plates, said collector plates being axially aligned and each having a central opening therethrough, the central openings of said collector plates being aligned to define an axially elongated gas-receiving passage surrounded by said plurality of collector plates, inlet means associated with one end of said plurality of collector

plates for permitting a gaseous stream to be supplied into said gas-receiving passage and then flow radially outwardly through channels defined between the adjacent collector plates, an end plate disposed adjacent the other end of said plurality of plates for closing the other end of said passage, ionizing means associated with said inlet means for ionizing the gaseous stream flowing therethrough, means for electrically insulatively supporting alternate ones of said collector plates from the others of said collector plates, and electrical connection means for supplying voltage to said alternate collector plates and said ionizing means, comprising the improvement



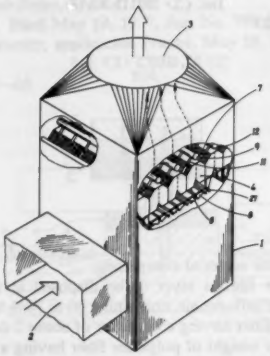
wherein the central openings of at least some of said collector plates are of decreasing diameter as the plates extend from one end thereof to the other end thereof so that the axially elongated gas-receiving passage decreases in cross-sectional area as it extends from said inlet means to said end plate, and wherein said plurality of plates extend at a nonperpendicular angle with respect to the axial direction of said passage so as to define a reverse slope as measured with respect to a radially outwardly extending direction which results in the radially outer edges of said plates being axially positioned between the radially inner edges of the plates and said inlet means.

4,093,433

DAMPER ASSEMBLY FOR MOBILE BED SCRUBBER

Mervin L. Smith, Sellersburg, Ind., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jul. 29, 1974, Ser. No. 492,705
Int. Cl.² B01D *47/12*
U.S. Cl. 55—226 **5 Claims**



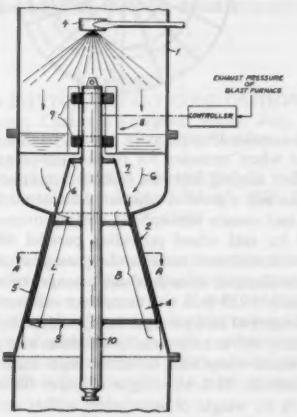
1. A wet scrubbing apparatus comprising: a housing with a fluid flow inlet and a fluid flow outlet; a plurality of contactor beds disposed within said housing, each bed including a fluid flow inlet and a fluid flow outlet, each said contactor bed fluid flow inlet being in fluid communication with said housing inlet; a spray means positioned to introduce scrubber solution into said contactor beds; each said contactor bed fluid flow outlet being in fluid communication with said housing outlet; a damper assembly pivotally disposed in each said contactor bed fluid flow inlet to control said contactor bed inlet fluid flow wherein individual contactor beds may be closed off to waste gas flow; each said contactor bed inlet includes an adjustable weir plate, said adjustable weir plate extending downwardly from the side of said inlet opposite a stop means, said weir plate in its downward extreme position abutting a trailing edge of said damper assembly in its normally closed position.

4,093,434

GAS-SCRUBBER APPARATUS FOR BLAST FURNACE

Gerhard Hausberg, Essen-Bredeney; Karl-Rudolf Hegemann, Essen-Bergerhausen; Günther Finger, Wesel; Hans Schäfer, Gelsenkirchen, and Helmut Weissert, Hamm, all of Germany, assignors to Gottfried Bischoff Bau Kompl. Gasreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft, Essen, Germany

Filed Mar. 25, 1976, Ser. No. 670,542
Claims priority, application Germany, Mar. 26, 1975, 2513360; Aug. 16, 1975, 2536534
Int. Cl.² B01D *47/00*
U.S. Cl. 55—226 **6 Claims**



1. A gas-cleaning apparatus for a high-pressure blast furnace comprising a cylindrical duct leading from the blast furnace, and an annular-gap washer connected to said duct, said annular-gap washer comprising:

wall means below said duct forming a frustoconical passage diverging progressively in the direction of gas flow;

a frustoconical insert body of complementary divergence received in said passage and defining with said wall means an annular gap of progressively increasing diameter from an inlet side of of said gap to an outlet side thereof:

means in said passage mounting said body for axial shifting relative to said wall means to adjust the radial width of said gap and control the pressure drop across the annular-gap washer, said body having the same conicity as said passage between said inlet and outlet sides;

nozzle means in said duct above said wall means and said body for spraying and scrubbing liquid into the gas entering the inlet side of said gap, said passage having a diameter at said outlet side corresponding to the diameter of said duct; and

a collecting chamber between said duct and said wall means, said chamber having an upper diameter equal to that of said duct and a lower diameter equal to that of said inlet side while forming a generally horizontal bottom on the level of said inlet side, said body having a projecting portion reaching into said chamber and engaging said mounting means for the axial shifting of said body, said

collecting chamber having a wall connected to said duct and to said wall means,

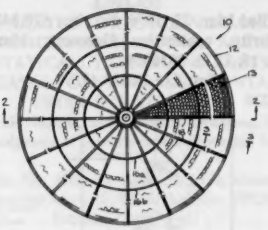
said gap being so dimensioned that the pressure drop along the length of said gap is substantially linear and the gas exits from said outlet side at substantially the same velocity as that with which it enters said inlet side.

4,093,435

TOTAL HEAT ENERGY EXCHANGERS

Albert J. Marron, Spring Lake, and Walter J. Markowski, Cranford, both of N.J., assignors to Wing Industries Inc., Cranford, N.J.

Continuation-in-part of Ser. No. 418,364, Nov. 23, 1973, abandoned. This application Jul. 17, 1975, Ser. No. 596,642
Int. Cl.[2] B01D *53/06*; F28D *19/04*
U.S. Cl. 55—269 24 Claims



14. In a make-up air supply system having a total energy exchange wheel mounted for rotation spanning across an air supply duct leading from the outside atmosphere into a room or the like and a parallel adjacent exhaust air duct from said room to said outside atmosphere, the improvement comprising a media for said wheel providing parallel tubular passages aligned with said airstreams for the passage of air through said wheel, the diameter of each of said passages being not less than substantially 0.055 inch nor more than substantially 0.12 inch and the length of said passages being within the range of from substantially 100 to substantially 400 times said passage diameter, said media comprising cellulosic paper material constituted by substantially 84% by weight of paper fibres and substantially 16% by weight of ammonium sulfide and diammonium phosphate, and the temperature and humidity conditions of the air received in said room through said media being in other than straight line relationship, when plotted on a psychrometric chart, with the temperature and humidity conditions of said outside atmosphere and said room air.

4,093,436

URANIUM ENRICHMENT APPARATUS HAVING A CASCADE OF SEPARATING STAGES IN A SINGLE UNIT

Werner Wenzel, Spellen, Germany, assignor to NUSTEP Trenndusen Entwicklungsund Patentverwertungsgesellschaft mbH & Co. Kommanditgeselischaft, Essen, Germany

Filed Sep. 22, 1976, Ser. No. 725,493
Claims priority, application Germany, Sep. 23, 1975, 2542296
Int. Cl.[2] B01D *51/08*
U.S. Cl. 55—269 6 Claims

1. An apparatus for isotopic enrichment of a gas, especially uranium enrichment, comprising:

an upright column formed as a vacuum-tight multipartite container having an upper portion, an intermediate portion and a lower portion, said column being formed at least in the regions of said intermediate and upper portions with a central mounting tube;

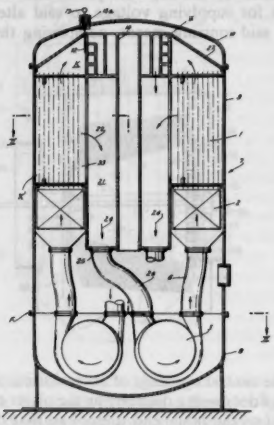
a multiplicity of radial partitions at least in said intermediate portion subdividing same into a plurality of sectors, said partitions being affixed to said mounting tube;

respective separating-nozzle units in each of said sectors for the isotopic separation of gas therein into light and heavy fractions;

respective coolers in said intermediate portion below each of said sectors for feeding gas to the respective unit;

respective compressors in said lower portion of said column for compressing gas and feeding it to each of said coolers;

duct means in said column for receiving respective fractions from the units of the units of the respective sectors and



mixing a light fraction from one unit with heavy fraction from another unit prior to passage into the respective compressor whereby said units are connected in cascade, said duct means including an annular gas distributor in said upper portion of said column having respective passages communicating with each sector at the top thereof; and

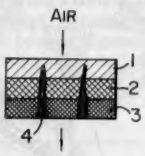
slider means for selectively controlling the flow cross-sections of said passages.

4,093,437

AIR FILTER MATERIAL

Hiroo Ichihara, Nagoya, and Yuzuru Ohta, Kasugai, both of Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Aug. 25, 1976, Ser. No. 717,667
Claims priority, application Japan, Aug. 26, 1975, 50-103744
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—487 6 Claims



1. An air filter material comprising:

(1) an upper fibrous layer to be disposed at upperstream position of influent air, containing 50 to 70% by weight of polyester fiber having a diameter of about 2 denier and 50 to 30% by weight of polyester fiber having a diameter of about 6 denier, the basis weight of said layer being 25 to 45 g/m^2;

(2) an intermediate fibrous layer containing 60 to 80% by weight of polyester fiber having a diameter of about 1.5 denier and 40 to 20% by weight of polyester fiber having a diameter of 2 to 2.5 denier, the basis weight of said intermediate layer being 40 to 60 g/m^2;

(3) a lower fibrous layer to be disposed at downstream posi-

tion of the influent air, containing 60 to 80% by weight of rayon fiber having a diameter of about 1.5 denier and 40 to 20% by weight of rayon fiber having a diameter of about 2 denier, the basis weight of said lower fibrous layer being 80 to 100 g/m^2;

(4) a resin applied to the unified mass of the said three fibrous layers to provide a fibrous layer lamination; and,

(5) a plurality of columns of intertwinement extending from one side of the fibrous layer lamination to the other to increase rigidity.

4,093,438

METHOD OF MAKING LAMINATED WINDSHIELDS

Robert M. Currie, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 28, 1977, Ser. No. 846,654
Int. Cl.^{2} C03B *23/02*
U.S. Cl. 65—62 **1 Claim**

1. A method of making windshields from a glass ribbon manufactured by a float process in which molten glass is flowed out upon a molten metal bath to form a ribbon of glass, wherein the ribbon of glass is stretched by longitudinally applied stretching forces to a thickness less than an equilibrium thickness, and wherein the ribbon of glass is removed from the molten metal bath and annealed, the glass ribbon developing drawlines therein in the direction of movement of the ribbon over the molten metal bath because of the stretching forces applied thereto, which method of making windshields comprises the steps of:

cutting oblong glass brackets from said glass ribbon in a manner that the drawlines run across the shorter dimension of the bracket;

cutting the so-formed glass brackets into windshield shaped articles;

forming pairs of windshield shaped articles;

bending said formed pairs of windshield shaped articles to a final windshield configuration; and

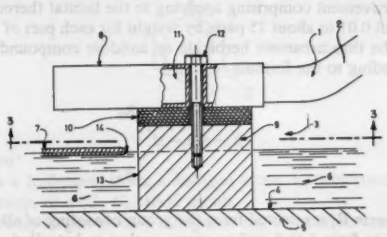
laminating formed pairs of the so-bent windshield shaped articles to produce completed windshields which have the drawlines of the glass aligned in the top to bottom direction.

4,093,439

METHOD AND APPARATUS FOR MANUFACTURING GLASS RIBBON ON A BATH OF MOLTEN METAL

Jean-Claude Coulon, Chalon sur Saone, France, and Piero Amannati, Pisa, Italy, assignors to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed May 19, 1977, Ser. No. 798,618
Claims priority, application France, May 19, 1976, 76 15049
Int. Cl.^{2} C03B *18/02*
U.S. Cl. 65—65 **15 Claims**



1. An apparatus for manufacturing glass ribbon comprising in combination:

(a) a tank containing a bath of molten metal on which is poured molten glass to form a glass ribbon; and

(b) a guide member disposed interior of side walls of the tank along opposite edges of the glass ribbon, a lower portion of said guide member being made of a non-wettable material and having means for thrusting the glass ribbon contacting the guide member in a direction generally transverse to the axis of the glass ribbon, said means for thrusting the glass ribbon being rotatable about a vertical axis, an upper portion of said guide member having means for cooling the edges of the glass ribbon, said cooling means being separated from said rotatable thrusting means above the surface of the molten metal bath by a thermal insulating means which prevents the cooling means from cooling the thrusting means.

13. A method for manufacturing a glass ribbon comprising:

(a) directing molten glass onto a bath of molten metal;

(b) advancing the molten glass along the molten metal bath so as to form a glass ribbon;

(c) guiding and simultaneously cooling the edges of the glass ribbon as the glass ribbon advances along the molten metal bath, the glass ribbon being guided by rotatable means disposed about a vertical axis for thrusting the glass ribbon in a direction generally transverse to the advancing flow of the glass ribbon and the cooling being performed by cooling means positioned above the glass ribbon, said thrusting means and cooling means being parts of a single structure disposed interior of side walls of the bath along opposite edges of the glass ribbon; and

(d) thermal insulating the thrusting means from said cooling means.

4,093,440

SOLID PHYTOSANITARY COMPOSITION

Claude Denninger, Chazay d'Azergues; Michel Joly, Villeurbanne, and Jean-Noel Tabet, Lyon, all of France, assignors to Sogemaric, Lyon, France

Filed July 10, 1975, Ser. No. 594,856
Claims priority, application France, Jul. 15, 1974, 74 25780
Int. Cl.^{2} A01N *17/08*
U.S. Cl. 71—65 **6 Claims**

1. A solid phytosanitary composition compacted into single doses for agricultural application intended to be progressively disintegrated by contact with a stream of water and containing a few to 80% by weight of an active material selected from the group consisting of a herbicide, growth regulator, and fertilizer, a solid nonhydrophilic filler of which talcum is the major component and 20–60% by weight of a solid water-insoluble starch.

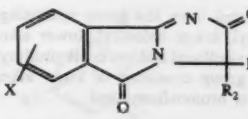
4,093,441

METHOD FOR INHIBITING BUD GROWTH OF PLANTS

Saleh Abdul-Kadir Ashkar, Madison, Wis., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 631,359, Nov. 12, 1975, Pat. No. 4,067,718. This application Sep. 9, 1977, Ser. No. 831,841
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—78 **9 Claims**

1. A method for inhibiting bud growth on plants comprising, contacting the plants with a bud growth inhibiting amount of a compound of the formula:



(I)

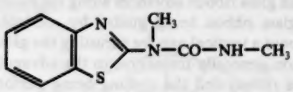
wherein X represents H, CH_3, Cl, OCH_3, SCH_3 or NO_2; R_1 is phenyl, vinyl or alkyl C_1–C_4; R_2 is alkyl C_1–C_4, provided that when R_1 is alkyl the sum of the carbon atoms in the groups represented by R_1 and R_2 is 5 to 7, and when R_1 and R_2 are taken together with the carbon atom to which they are attached, they may represent cycloalkyl C_5–C_6 optionally substituted with methyl; and the optical and stereoisomers thereof.

4,093,442
SYNERGISTIC HERBICIDAL COMPOSITIONS COMPRISING 3-(BENZTHIAZOL-2-yl)-1,3-DIMETHYLUREA AND A SUBSTITUTED DIPHENYL ETHER

Robert Rudolf Schmidt, Cologne, and Lothar Rohe, Wuppertal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

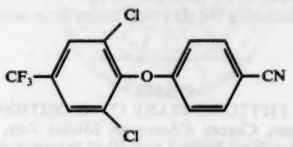
Filed Jun. 2, 1976, Ser. No. 692,169
Claims priority, application Germany, Jun. 19, 1975, 2527394
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—90 10 Claims

1. A herbicidal composition containing as active ingredients synergistically effective amounts of (1) 3-(benzthiazol-2-yl)-1,3-dimethylurea, of the formula



(I),

and (2) 2,6-dichloro-4-trifluoromethyl-4'-cyano-diphenyl ether of the formula



(II)

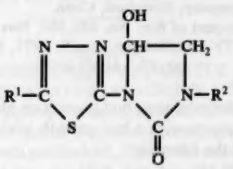
said composition containing (1) the urea and (2) the diphenyl ether in a ratio by weight of 1:0.1 to 1.

4,093,443
THIADIAZOLYLIMIDAZOLIDINONES

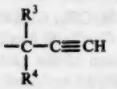
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 494,441, Aug. 5, 1974, Pat. No. 4,028,375.
This application Apr. 7, 1977, Ser. No. 785,711
The portion of the term of this patent subsequent to Jun. 15, 1993, has been disclaimed.
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—90 9 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; and R^2 is selected from the group consisting of lower alkenyl, lower chloroalkenyl, lower bromoalkenyl and



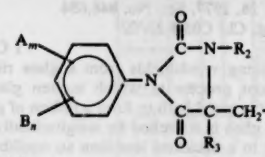
wherein R^3 and R^4 are selected from the group consisting of hydrogen and alkyl of up to three carbon atoms.

4,093,444
HYDANTOIN DERIVATIVES AND METHODS FOR REGULATING PLANT-GROWTH

Claude Clapot, Oullins; Jean Vial, Tassin, and Louis Dumont, Chaponost, all of France, assignors to PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques, Lyons, France

Division of Ser. No. 472,471, May 22, 1974, Pat. No. 3,990,883.
This application Sep. 21, 1976, Ser. No. 725,295
Claims priority, application France, May 22, 1973, 73 19579
Int. Cl.[2] A01N 9/12; C07D 233/76
U.S. Cl. 71—92 6 Claims

1. A process for modifying the growth of plants wherein the plants are treated with an effective amount of a compound corresponding to the formula:



in which

A represents hydrogen or halogen, except that the phenyl radical is not 3,5-dihalogenated,

B represents hydrogen, an alkyl, alkoxy, NO_2, CN, COOR' where R' = hydrogen, alkyl, the alkyl part of the radicals containing from 1 to 5 carbon atoms,

m is an integer from 0 to 5,

n is an integer from 0 to 3;

m and *n* together being at most equal to 5;

R_3 represents hydrogen or an alkyl radical containing 1 to 5 carbon atoms;

R_2 represents hydrogen, an optionally halogenated or hydroxy substituted C_1 - C_5 alkyl radical, a C_1 - C_5 alkanoyl radical, a carbamoyl radical monosubstituted or disubstituted on the nitrogen by C_1 - C_5 alkyl;

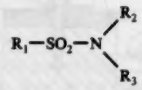
or a plant-growth-modifying salt thereof.

4,093,445
SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical, Westport, Conn.

Division of Ser. No. 285,971, Sep. 5, 1972, Pat. No. 4,021,229.
This application Jan. 24, 1977, Ser. No. 761,841
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—100 24 Claims

1. In the method of controlling weeds wherein a thiocarbamate herbicide is applied to the habitat of said weeds, the improvement comprising applying to the habitat thereof from about 0.01 to about 15 parts by weight for each part of weight of the thiocarbamate herbicide an antidote compound corresponding to the formula



wherein R_1 is selected from the group consisting of alkyl containing from 1 to 6 carbon atoms, inclusive, haloalkyl containing from 1 to 6 carbon atoms, inclusive, and in which halo includes chloro, bromo and fluoro, halogen which includes chlorine, bromine, and fluorine, isocyanate, alkenylamino, in which alkenyl contains from 3 to 6 carbon atoms, inclusive, halophenylamino wherein halo includes chloro, bromo and fluoro, phenyl, substituted phenyl wherein said substituents can be selected from alkyl containing from 1 to 4 carbon atoms, inclusive, alkoxy containing from 1 to 4 carbon atoms, inclu-

sive, halogen which includes chlorine, bromine, and fluorine, nitro, amino and haloalkylaminosulfonyl containing from 1 to 4 carbon atoms, inclusive, and halo includes chloro, bromo and fluoro; R_2 and R_3 can be the same or different and are selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, inclusive, haloalkyl containing from 1 to 6 carbon atoms, inclusive, and halo includes chloro, bromo and fluoro, alkoxy containing from 1 to 6 carbon atoms, inclusive, alkenyl containing from 3 to 6 carbon atoms, inclusive, alkynoxy, containing from 3 to 6 carbon atoms, inclusive, haloalkoxycarbonyl containing from 3 to 6 carbon atoms, inclusive, and wherein halo includes, chloro, bromo and fluoro, alkynoxycarbonyl containing from 3 to 6 carbon atoms, inclusive, carbamoyl, haloalkylthio containing from 1 to 6 carbon atoms, inclusive, in which halo includes chloro, bromo, and fluoro, diacetonitrilocarbamoyl, phenyl, substituted phenyl wherein said substituents can be selected from alkoxy containing from 1 to 4 carbon atoms, inclusive, halogen which includes chlorine, bromine and fluorine, hydroxy, nitro and carbamoyl, and R_2 and R_3 taken together form the ring structure alkyloxazolidyl in which each alkyl substituted contains from 1 to 4 carbon atoms, inclusive, as mono, di, tri or tetra substituents.

4,093,446

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

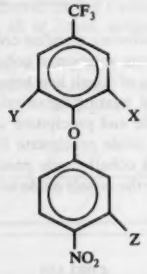
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, and Ser. No. 617,562, Sep. 29, 1975, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, said Ser. No. 617,562, is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Aug. 31, 1976, Ser. No. 719,484

Int. Cl.[2] A01N *9/20*; C07C *79/46*

U.S. Cl. 71—109 **15 Claims**

1. A compound of the formula



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4) alkyl group,

T is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a (C_1–C_4) alkoxy group having one or more hydrogen atoms replaced by a carboxy group, or an agronomically-acceptable salt thereof, or a carb(C_1–C_4)alkoxy group.

12. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

4,093,447

N-ARYLCARBAMIC ACID ESTERS AND PLANT GROWTH REGULANT COMPOSITIONS AND METHODS

Carl Metzger, Wuppertal-Vohwinkel; Gerhard Jager, Wuppertal-Elberfeld, and Klaus Lurssen, Koenigsdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

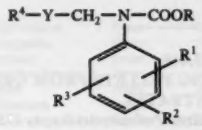
Division of Ser. No. 265,909, Jun. 23, 1972, Pat. No. 3,920,727. This application Nov. 17, 1975, Ser. No. 632,742

Claims priority, application Germany, Jun. 23, 1971, 2131028; Mar. 23, 1972, 2214057

Int. Cl.[2] A01N *9/20*; C07C *125/06*

U.S. Cl. 71—111 **20 Claims**

1. N-arylcarbamate of the formula



wherein

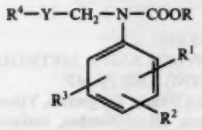
R is open-chain lower aliphatic hydrocarbyl containing up to ten carbon atoms or open chain substituted lower aliphatic hydrocarbyl wherein the substituents are hydroxy, halogen, alkoxy having 1 to 4 carbon atoms, aryl or substituted aryl having 6 to 10 carbon atoms; said substituted aryl being substituted by at least one member selected from the group consisting of halogen, alkyl of from 1 to 4 carbon atoms, haloalkyl of from 1 to 4 carbon atoms and 1 to 3 halogen atoms, alkoxy of from 1 to 4 carbon atoms and nitro R^1, R^2, and R^3 are individually selected from the group consisting of hydrogen, alkyl and haloalkyl of from 1 to 10 carbon atoms, alkoxy of from 1 to 10 carbon atoms, cycloalkyl of up to 8 carbon atoms and halogen.

R^4 is alkyl with 1 to 6 carbon atoms, alkenyl with 3 to 6 carbon atoms, alkynyl with 3 to 6 carbon atoms, haloalkyl with 1 to 6 carbon atoms and 1 to 3 halogen atoms, alkoxyalkyl, alkylthioalkyl, carbalkoxyalkyl and carbalkoxyalkenyl each with 1 to 4 carbon atoms in the alkoxy or alkylthio part and 1 to 4 carbon atoms in the alkyl part, cycloalkyl with 3 to 8 carbon atoms or aryl, aralkyl, aryloxyalkyl or arylthioalkyl with, in each case, 6 to 10 carbon atoms in the aryl part and 1 to 3 carbon atoms in the alkyl part, the aryl part of the four last-mentioned radicals being unsubstituted or substituted by halogen, alkyl with 1 to 3 carbon atoms, alkoxy with 1 to 3 carbon atoms, haloalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms and

Y is oxygen or sulfur.

16. Plant-growth regulant composition comprising an agriculturally acceptable carrier and, as an active ingredient, plant growth regulatingly effective amounts of a compound as claimed in claim 1.

17. Method of regulating the growth of plants which comprises applying to the plants or their habitat an effective amount of an N-aryl carbamate of the formula



wherein

R is open-chain lower aliphatic hydrocarbyl containing up to 10 carbon atoms or substituted open-chain lower aliphatic hydrocarbyl wherein the substituents are hydroxy, halogen, alkoxy having 1 to 4 carbon atoms or aryl having 6 to 10 carbon atoms.

R^1, R^2 and R^3 are individually selected from the group con-

sisting of hydrogen, alkyl and haloalkyl of from 1 to 10 carbon atoms, alkoxy of from 1 to 10 carbon atoms, cycloalkyl of up to 8 carbon atoms and halogen;

R^4 is alkyl with 1 to 6 carbon atoms, alkenyl with 3 to 6 carbon atoms, alkynyl with 3 to 6 carbon atoms, haloalkyl with 1 to 6 carbon atoms and 1 to 3 halogen atoms, alkoxyalkyl alkylthioalkyl, carbalkoxyalkyl and carbalkoxyalkenyl each with 1 to 4 carbon atoms in the alkoxy or alkylthio part and 1 to 4 carbon atoms in the alkyl part, cycloalkyl with 3 to 8 carbon atoms or aryl, aralkyl, aryloxyalkyl or arylthioalkyl with, in each case, 6 to 10 carbon atoms in the aryl part and 1 to 3 carbon atoms in the alkyl part, the aryl part of the four last-mentioned radicals being unsubstituted or substituted by halogen, alkyl with 1 to 3 carbon atoms, alkoxy with 1 to 3 carbon atoms, haloalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms and

Y is oxygen or sulfur.

4,093,448

METHOD OF PRODUCING PELLETS FROM ORE CONCENTRATES

Stanislav Borisovich Eliseev, ulitsa Peshestreletskaya, 115, kv. 1, Voronezh; Jury Alexandrovich Butskoi, selo Podgornoe, ulitsa 9 Yanvarya, 31, Voronezhskaya oblast, Ramonsky raion; Vladimir Sergeevich Dmitrievsky, ulitsa Studencheskava, 31, kv. 21, Voronezh; Albina Andreevna Golubeva, ulitsa Koltsovskaya, 77, kv. 41, Voronezh; Vladimir Mikhailovich Ozerov, ulitsa Svobody, 59, kv. 12, Voronezh; Valentin Stepanovich Volkov, ulitsa Khalzunova, 37, kv. 50, Voronezh, and Iya Petrovna Vasninova-Shipulina, ulitsa Tsimlyanskaya, 2, kv. 32, Voronezh, all of U.S.S.R.

Continuation of Ser. No. 519,018, Oct. 29, 1974, abandoned.
This application Sep. 27, 1976, Ser. No. 726,968
Int. Cl.[2] C22B *1/08*
U.S. Cl. 75—3 **9 Claims**

1. In a method of producing pellets from ore concentrates of particle size less than 0.83 mm, comprising mixing ore concentrate with a binding material, the major portion of which being selected from the group consisting essentially of calcium oxide, magnesium oxide and mixtures thereof to produce a total homogeneous mixture of said components, pelletizing said total homogeneous mixture to produce pellets and curing said pellets in saturated steam at a temperature of from 100° C to 350° C within a time period sufficient for their hardening, the improvement being that said mixing is performed in the following sequential steps:

a. mixing said ore concentrate and said binding material to form a first prepared mixture,

b. subjecting said first prepared mixture to hydration to form a first prepared hydrated mixture,

c. further mixing said first prepared hydrated mixture until homogenous to form a first prepared homogenous hydrated mixture, and

d. mixing said first prepared homogenous hydrated mixture with an additional amount of said ore concentrate to form said total homogeneous mixture so that said total homogenous mixture of said first prepared homogenous hydrated mixture and said additional ore concentrate contains 4 to 15 weight percent of said binding material.

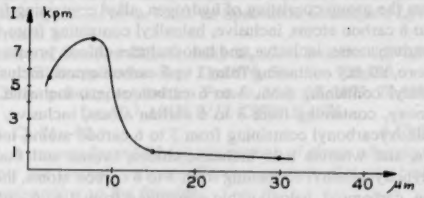
4,093,449

PHOSPHORUS STEEL POWDER AND A METHOD OF MANUFACTURING THE SAME

Lars-Erik Svensson, Hogans; Jan Robert Tengzelius, Viken, and Per Folke Lindskog, Hoganas, all of Sweden, assignors to Hoganas AB, Fack, Hoganas, Sweden

Filed Oct. 26, 1976, Ser. No. 735,207
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—0.5 R **13 Claims**

1. A phosphorous steel powder for manufacturing sintered mouldings having high toughness and strength, comprising a basic powder of a steel powder substantially free from phosphorus and having good compressibility to which is intimately added a low-temperature-melting ferrophosphorus powder having a phosphorus content of at least 2.8%, in such an



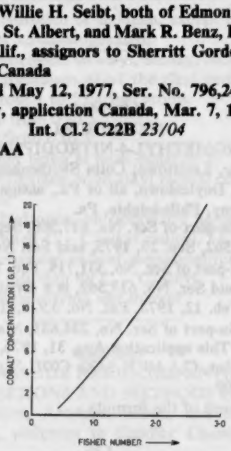
amount that the phosphorus content of the mixture is 0.2 to 1.5%, wherein the ferrophosphorus powder has a maximum particle size of 20 μm.

4,093,450

PRODUCTION OF ULTRAFINE COBALT POWDER FROM DILUTE SOLUTION

Barry N. Doyle; Willie H. Seibt, both of Edmonton; Kshitindra Mohan Sarkar, St. Albert, and Mark R. Benz, Fort Saskatchewan, all of, Calif., assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed May 12, 1977, Ser. No. 796,241
Claims priority, application Canada, Mar. 7, 1977, 273334
Int. Cl.[2] C22B *23/04*
U.S. Cl. 75—0.5 AA **10 Claims**



1. A process for producing ultrafine cobalt powder comprising providing an aqueous solution of cobalt ammine carbonate, with the concentration of cobalt ions being in the range of from about 1 to about 20 gpl, heating the solution to drive off ammonia and carbon dioxide and precipitate ultrafine cobalt oxide, separating the cobalt oxide precipitate from the solution, and heating the separated cobalt oxide precipitate in a reducing atmosphere to reduce the cobalt oxide to ultrafine cobalt powder.

4,093,451

COKE AGGLOMERATE AND METHOD OF UTILIZING SAME

Boyd E. Cass, Ligonier; David W. Coate, and Joseph R. Quigley, both of Pittsburgh, all of Pa., assignors to Cardd, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1977, Ser. No. 837,531
Int. Cl.[2] C22B *1/08*
U.S. Cl. 75—43 **23 Claims**

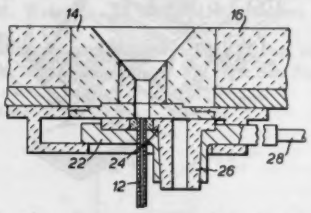
1. A coke agglomerate consisting essentially of a cured agglomerated mixture by weight of 30–70% coke fines, 5–15% cement on a dry basis, and 15–65% of at least one finely divided calcium bearing material selected from the group consisting of calcium hydroxide, calcium carbonate, and calcium fluoride.

4,093,452

REFINING LIQUID METAL

Gene Donald Spenceley, Penistone, Near Sheffield, and Neil Pigott, Rotherham, both of England, assignors to British Steel Corporation, London, England

Filed July 20, 1976, Ser. No. 707,060
Claims priority, application United Kingdom, July 23, 1975, 30841/75
Int. Cl.[2] C21C 7/00, 7/06
U.S. Cl. 75—53 10 Claims



1. A method of treating a molten metal in a transfer container having a top, a base and a discharge nozzle in the base, said nozzle having, on the exterior of the container, a sliding gate valve assembly for controlling the discharge of metal from the nozzle and the introduction of reagent material entrained within a gas directly into the molten metal to promote the efficiency of mixing and reaction, said valve assembly comprising a discharge spout, a gas inlet pipe and a closure portion, said spout, pipe and closure portion being selectively movable into alignment with the discharge nozzle of the container, which comprises introducing the molten metal through the top of the transfer container while the nozzle of said container is stopped by the gate valve, moving said gate valve and introducing through the inlet pipe a particulate re-agent material entrained within a gas to promote efficient mixing and reacting of the re-agent with the molten metal and then removing the treated molten metal through the sliding gate valve.

4,093,453

METHOD OF MAKING AN ORDERED ALLOY

Yoshimi Makino, Fujisawa; Satoru Uedaira, and Shigeyasu Ito, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,121
Claims priority, application Japan, Dec. 20, 1974, 49-146423
Int. Cl.[2] C22C 33/00, 1/00
U.S. Cl. 75—129 9 Claims

1. A method for making a substantially ordered alloy containing at least a first metallic element and a second metallic element comprising the steps of:

(a) providing a solid, imperforate metal base consisting of at least said first metallic element,

(b) depositing a thin metal layer on said base, said metal layer consisting of at least said second metallic element, said second metallic element being capable of forming an ordered alloy with said first metallic element, said metal layer being not in excess of 10 microns in thickness, and

(c) heating said metal base and the deposited metal layer at a temperature below the order-disorder transformation temperature of the ordered alloy to be made for a sufficient length of time to cause diffusion of said deposited metal into said metal base and formation of a continuous layer of ordered alloy between the two metals.

4,093,454

NICKEL-BASE SINTERED ALLOY

Yuichi Saito, and Osamu Mayama, both of Niigata, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,932
Claims priority, application Japan, Dec. 18, 1975, 50-150123
Int. Cl.[2] B22F 1/00
U.S. Cl. 75—236 4 Claims

1. A nickel-base sintered alloy having a density of at least 95 percent of the theoretical density thereof, and consisting essentially of, in weight percentage:

chromium	from	10.0	to	35.0 %
tungsten	from	0.5	to	15.0 %
cobalt	from	0.2	to	12.0 %
molybdenum	from	0.1	to	20.0 %
iron	from	0.1	to	20.0 %
titanium	from	0.05	to	2.00 %
silicon	from	0.05	to	1.50 %
manganese	from	0.05	to	1.00 %
carbon	from	0.1	to	3.5 %

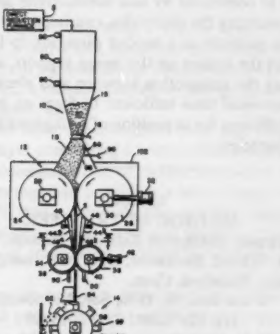
and the balance nickel and incidental impurities: said nickel-base sintered alloy being prepared by sintering a reduced powder mixture consisting of said metals and carbides of said metals, said reduced powder mixture being prepared by the steps comprising simultaneously reducing a mixed powder consisting essentially of powders of oxides of elements constituting said sintered alloy and carbon powder to produce a reduced sponge-like mass, and pulverizing said reduced sponge-like mass to obtain said reduced powder mixture; said alloy and said reduced powder mixture having substantially the same elemental chemical composition.

4,093,455

COMPACTED, PASSIVATED METALLIZED IRON PRODUCT

Wolfgang B. Pietsch, Matthews, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Continuation of Ser. No. 584,184, Jun. 5, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,243
Int. Cl.[2] C22B 1/24
U.S. Cl. 75—256 5 Claims



1. A compacted, passivated, metallized iron product useful as a feed material for a steelmaking process, said product hav-

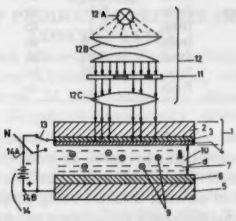
ing dense, substantially pore-free faces with a densified surface layer on each face of from 0.1 to 1.0 mm thick and a surface density of from about 6.5 to 7.9 g/cc, a less dense center with an average density of at least 4.5 g/cc, and wherein from about 75% to about 96% of the total iron present is in the metallic state.

4,093,456

PROCESS AND DEVICE FOR ELECTROPHOTOGRAPHIC IMAGE GENERATION AND APPLICATION OF THE PROCESS

Hansjürg Hermann, Egg, Switzerland, assignor to Konishiroku Photo Ind., Ltd., Hino, Japan

Filed Jun. 11, 1976, Ser. No. 695,279
Claims priority, application Germany, June 25, 1975, 2528341
Int. Cl.[2] G03G *15/01, 15/22*
U.S. Cl. 96—1 PE **8 Claims**



1. A method of producing images in accordance with a master, comprising the steps of:

(a) providing a photoconductive layer spaced from an image support adjacent thereto, and electrodes respectively associated therewith,

(b) bringing a dispersion of charged toner particles into the space between said layer and said support, while shunting the electrodes,

(c) exposing the photoconductive layer to a light image of the master, thereby producing with respect to said layer, a conductivity image corresponding to the master,

(d) applying an electric field across said space by means including the electrodes during at least part of the exposure, said field causing migration of the charged toner particles in a first direction, with change of toner particle charge as controlled by said conductivity image,

(e) again shunting the electrodes, causing a further migration of toner particles in a second direction to form a visible image of the master on the image support, and

(f) opening the connection between said electrodes after a predetermined time sufficient to form an intense image, but insufficient for deposition of background consisting of toner particles.

4,093,457

METHOD OF TRANSFER

Oscar G. Hauser, Rochester; Kallis H. Mannik, Webster, and Charles A. Whited, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

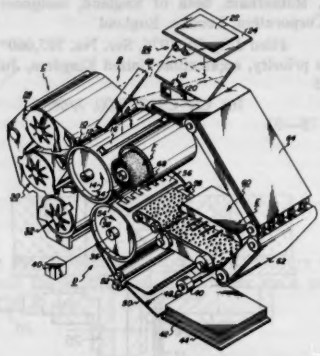
Filed Jun. 10, 1976, Ser. No. 694,853
Int. Cl.[2] G03G *13/01, 13/08*
U.S. Cl. 96—1.2 **5 Claims**

1. A method of producing a copy, including the steps of:

recording successive electrostatic latent images on a member;

developing each successive electrostatic latent image with particles having differing triboelectric charges; and

transferring the particles from the successive electrostatic latent images to a sheet of support material in a pre-determined sequence wherein each successive layer of particles transferred to the sheet of support material has a decreasing triboelectric charge, thereby minimizing back transfer



from the sheet of support material to the electrostatic latent image.

4,093,458

POLYURETHANE-POLYANHYDRIDE SUBBING LAYER FOR PHOTO SENSITIVE ELEMENTS

Patrick Terence McGrail, Ipswich; Stephen Richard Smith, Manningtree; Frederick Robert Bannister, Colchester, and David Leonard Boutle, Maldon, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 416,496, Nov. 16, 1973, abandoned. This application Jun. 1, 1976, Ser. No. 691,461
Claims priority, application United Kingdom, Nov. 20, 1972, 53492/72; Jul. 13, 1973, 33446/73
Int. Cl.[2] G03C *1/78*
U.S. Cl. 96—87 R **9 Claims**

1. A photographic film material, which comprises a biaxially oriented film support of a linear polyester having a subbing layer and a hydrophilic light sensitive layer applied to one or both surfaces thereof wherein the subbing layer is adherent to the film support, and comprises a mixture consisting essentially of at least one polyurethane resin with at least one anhydride polymer selected from the group consisting of:

(a) at least one homopolymer of a polymerisable unsatured cyclic carboxylic acid anhydride wherein said mixture contains from about 16.5% by weight of the anhydride polymer; and

(b) at least one copolymer of a polymerisable unsaturated cyclic acid anhydride wherein said mixture contains from about 10% by weight of the anhydride polymer, the mixture containing up to 75% by weight of said anhydride polymer.

4,093,459

TREATED CARRIER PARTICLES USED IN ELECTROPHOTOGRAPHIC PROCESS

Virgil W. Westdale, Chagrin Falls, Ohio, and John Novotny, San Jose, Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 728,461, Sep. 29, 1976. This application Mar. 14, 1977, Ser. No. 777,628
Int. Cl.[2] G03G *13/08*
U.S. Cl. 96—1 SD **6 Claims**

1. A process for developing a latent electrostatic image which comprises mixing an electroscopic powder with a carrier which comprises a member selected from a group consisting of metallic particles and siliceous particles to the surface of which is adhered a mixture of a metallic sulfide and a member selected from the group consisting of perfluorinated and substantially perfluorinated carboxylic acids containing from 3 to

18 carbon atoms and salts, esters and amides thereof, said sulfide and acid being present in a ratio by weight of sulfide to acid of about 0.2:1 to 5:1, to impart opposite electrostatic charges to said electroscopid powder and said carrier, whereby said electroscopic powder is attracted to said carrier and transferring said electroscopic powder from said carrier to said latent electrostatic image.

4,093,460

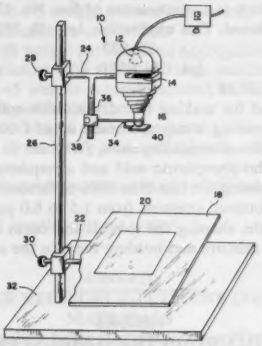
CONTRAST ENHANCEMENT AND SMALL DETAIL BLENDING OF PHOTOGRAPHIC IMAGES

Leonard M. Weinstein, 13 Burke Ave., Newport News, Va. 23601

Continuation-in-part of Ser. No. 395,494, Sep. 10, 1973, abandoned. This application Apr. 15, 1976, Ser. No. 677,644

Int. Cl.[2] G03C *5/04*

U.S. Cl. 96—27 E **6 Claims**



1. A method of blending the granular appearance and small details of a projected image which comprises the steps of:

providing a projection system including a light source, a lens, and an image source;

inserting a linear radial transmission filter immediately adjacent to said lens whereby said projection system projects an image through said linear radial transmission filter;

placing a projection surface at the sharp focus position of the projection system whereby an image is secured;

moving said projection surface away from said sharp focus position thereby causing the granular structure and small detail of said image to be blended such that individual portions of the granular structure are not distinguishable from each other.

4,093,461

POSITIVE WORKING THERMALLY STABLE PHOTORESIST COMPOSITION, ARTICLE AND METHOD OF USING

Frank J. Loprest, Binghamton, N.Y., and Eugene F. McInerney, Chagrin Falls, Ohio, assignors to GAF Corporation, Wayne, N.J.

Filed Jul. 18, 1975, Ser. No. 597,226

Int. Cl.[2] G03C *1/54, 1/60, 5/34*

U.S. Cl. 96—36 **23 Claims**

1. A positive working photoresist composition, comprising a mixture of a light-sensitive orthoquinone diazide or ortho naphthoquinone diazide and a polyamic acid condensation product of an aromatic dianhydride and an aromatic di-primary amine.

6. A photosensitive material, comprising a mixture of a support having coated thereon a layer comprising a light-sensitive orthoquinone diazide or orthonaphthoquinone diazide and a polyamic acid condensation product of an aromatic dianhydride and an aromatic di-primary amine.

13. A method of forming a thermally stable positive photoresist image, which comprises imagewise exposing to actinic light the photosensitive material according to claim 6, and developing a positive relief image by treating the exposed layer with an alkaline aqueous developer thereby removing the imagewise exposed areas.

4,093,462

2,5-BIS(SECONDARY AMINO) OXA- AND THIADIAZOLE PHOTOGRAPHIC DEVELOPING AGENTS

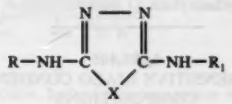
Henry Wolf Altland; Stanley Wray Cowan, both of Rochester, and Ismael Adolfo Olivares, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 11, 1976, Ser. No. 741,164

Int. Cl.[2] G03C *5/30*; C07D *277/38*

U.S. Cl. 96—66 HD **23 Claims**

15. A photographic process comprising developing an imagewise exposed photographic silver halide layer in the presence of a silver halide developing agent of the formula:



wherein each of R-NH— and —NH-R_1 is a secondary amino group, R and R_1 are independently selected from the group consisting of 1 to 4 carbon alkyl; 1 to 4 carbon alkyl substituted with alkoxy of 1 to 2 carbon atoms; 1 to 4 carbon alkyl substituted with alkylthio of 1 to 2 carbon atoms; aryl; aryl substituted with alkoxy of 1 to 2 carbon atoms; aryl substituted with alkylthio of 1 to 2 carbon atoms; and X is sulfur or oxygen.

4,093,463

WATER SOLUBLE BINDER OVERCOAT ON VESICULAR ELEMENT CONTAINING N_2-RELEASING AGENT

George Leland Fletcher, Pittsford, and Michael Mosehauer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,969

Int. Cl.[2] G03C *1/52, 1/68*

U.S. Cl. 96—67 **19 Claims**

1. A radiation-sensitive vesicular imaging element comprising, in laminar relationship,

(a) a support,

(b) a first layer comprising a binder that is substantially insoluble in water and, uniformly distributed in said binder in an amount between about 1 and about 15% by weight of said binder, a radiation-sensitive nitrogen-releasing, vesiculating agent; and

(c) a second layer superimposed over said first layer, said second layer comprising a water-soluble binder, said layer being substantially free of radiation-sensitive material,

said binders together providing a latent image stability period for N_2 that is sufficient for vesicular imaging.

8. A radiation-sensitive vesicular imaging element having enhanced speed comprising, in laminar relationship,

a support,

a first layer comprising a mixture of poly(-chloroacrylonitrile) and poly(vinylidene chloride-co-acrylonitrile), and uniformly admixed with said mixture in an amount between about 1 and about 15% by weight of said binder, 2,5-dimethoxy-4-morpholinobenzene diazonium hexafluorophosphate;

and a second layer superimposed over said first layer and comprising poly(vinyl alcohol) and a crosslinking agent, said second layer being substantially free of radiation-sensitive material;

said polymers of said layers together providing a latent

image stability period for N_2 that is sufficient for vesicular imaging.

4,093,464

LIGHT SENSITIVE O-QUINONE DIAZIDE CONTAINING TRANSFER COMPOSITION

Hans Ruckert, Naurod, and Barbara Wildenhain, Wiesbaden-Sonnenberg, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jul. 26, 1973, Ser. No. 382,864
Claims priority, application Germany, Jul. 27, 1972, 2236941
Int. Cl.[2] G03C *1/54, 1/60*
U.S. Cl. 96—91 D 2 Claims

1. A light-sensitive transfer composition comprising, as separate compounds in a homogeneous mixture,

(a) about 25 to 40% by weight of an alkali-soluble novolak,

(b) about 12 to 30% by weight of an o-naphthoquinone diazide sulfonic acid derivative selected from the group consisting of esters thereof and amides thereof, and

(c) about 5 to 30% by weight of a polyalkyl acrylate or a polyalkyl methacrylate.

4,093,465

PHOTOSENSITIVE DIAZO CONDENSATE COMPOSITIONS

Simon L. Chu, and Eugene Golda, both of Yonkers, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 388,313, Aug. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,845, Sep. 22, 1971, abandoned, which is a continuation of Ser. No. 738,857, Jun. 21, 1968, abandoned. This application Mar. 12, 1975, Ser. No. 557,731
Int. Cl.[2] G03C *1/52, 1/70*
U.S. Cl. 96—115 R 2 Claims

1. A light sensitive, solvent soluble, oleophilic film forming composition, which comprises:

A. A light sensitive, light hardenable, organic solvent soluble, substantially water-insoluble reaction product of:

1. A water-soluble, light sensitive condensation product of:

a. A negative acting diazonium salt of diphenylamine; and

b. An organic reactive carbonyl-containing condensing compound therefore; with

2. About an equimolar amount of a water insolubilizing alkali metal thiocyanate; and

B. An organic solvent soluble, substantially water insoluble epoxy resin; said composition capable of being coated onto a base sheet from solution in an organic solvent or substantially organic solvent medium to form a tack-free continuous surface; exposed to light in a predetermined area to harden the coating in such area; and removed from unexposed area by an aqueous or substantially aqueous developer.

4,093,466

ELECTROLESS TIN AND TIN-LEAD ALLOY PLATING BATHS

Thomas Francis Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 6, 1975, Ser. No. 574,979
Int. Cl.[2] C23C *3/02*
U.S. Cl. 106—1.22 6 Claims

1. A salt composition, when diluted with 1 liter of water and sufficient hydrochloric acid to provide a solution having a pH of 0.5 to 1, is suitable for immersion plating of tin-lead alloys at increased rates, the salt composition comprising the proportions of:

a.	hydrous stannous chloride ($SnCl_2 . 2H_2O$)	from about 10 to about 150 g,
b.	lead chloride ($PbCl_2$)	from about 1 to about 12 g,
c.	sodium hypophosphite ($NaH_2PO_2 . H_2O$)	from about 10 to about 100 g, and
d.	thiourea ($NH_2 . CS . NH_2$)	from about 15 to about 100 g,

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4,093,467

METHOD FOR MAKING FOUNDRY MOULDS AND CORES

Abram Moiseevich Lyass, Sharikopodshipnikovskaya ulitsa, 2, kv. 146; Sergei Semenovich Zhukovsky, Profsojuznaya ulitsa, 17, korpus 1, kv. 15, and Sergei Dmitrievich Teplyakov, Seleznevskaya ulitsa, 13, kv. 3, all of Moscow, U.S.S.R.

Continuation of Ser. No. 435,019, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 306,336, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 131,533, Apr. 5, 1971, abandoned. This application Apr. 28, 1976, Ser. No. 680,923
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.35 10 Claims

1. A method for making foundry moulds and cores which comprises preparing a mixture made up of from 94.0 to 98.5 parts by weight of moulding sand, from 2.0 to 10.0 parts by weight of ortho-phosphoric acid and a requisite amount of a material containing not less than 30% of ferrous oxide, so that the mixture obtained contains from 1.5 to 6.0 parts by weight of ferrous oxide, shaping the moulds and cores obtained from the moulding mixture and holding them in the air for hardening.

4,093,468

PROCESS TO OBTAIN TRANSPARENT COLORLESS AND GLASS-CERAMICS SO OBTAINED

Marius Charles Boitel, Avon, and Serge Andre Maurice Renault, Montigny sur Loing, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,513
Int. Cl.[2] C03C *3/22, 3/04*
U.S. Cl. 106—39.7 2 Claims

1. Sensibly colorless transpartent glass-ceramics wherein beta-quartz solid solution constitutes the predominant crystal phase having base compositions within the Li_2O-Al_2O_3-SiO_2 field which contain, on the basis of oxides and as calculated from the batch, about 0.5–6% by weight TiO_2, an amount of Fe_2O_3 up to about 500 ppm, and about 0.03–0.75% by weight Nd_2O_3.

4,093,469

MOLDED GLASS ARTICLES HAVING BULK HOMOGENEITY AND OPTICAL QUALITY SURFACE

Leon M. Sanford, and Che-Kuang Wu, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 689,791, May 25, 1976, Pat. No. 4,046,545. This application Apr. 20, 1977, Ser. No. 789,105
Int. Cl.[2] C03C *3/10, 3/04, 3/30*
U.S. Cl. 106—53 4 Claims

1. A hydrated glass article consisting essentially, in mole percent on the anhydrous basis, of about 70–82% SiO_2, 10–17% Na_2O and/or K_2O, and 5–15% ZnO and/or PbO, and having a water content of about 3–8% by weight of the total article. said water content being tightly bound within the article such that, upon DTG analysis, the glass demonstrates no water loss below about 120° C. and consisting of silanol groups and molecular water present in such proportions that the ratio of silanol groups to molecular water is equal to or greater than 1.0, said glass article having at least one portion with the surface thereof having a smoothness such that over a distance of at least 0.1 inch, on an arithmetic average basis, the Roughness Height is less than 3.0 microinches and having a

substantially uniform refractive index thoughout the bulk of the glass such that a transmissivity of visible light of about 92% is demonstrated.

4,093,470

ALUMINA REFRACTORIES

Carl James Cherry, King of Prussia, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 20, 1976, Ser. No. 734,141
Int. Cl.[2] C04B *35/10*
U.S. Cl. 106—56 11 Claims

1. An unshaped, unfired refractory material for use in monolithic refractory construction comprising a mixture of a volatilized silica slurry and a refractory batch wherein said volatilized silica slurry comprises:

a. from 60.0 to 90.0 weight percent water,
b. from 10.0 to 40.0 weight percent volatilized silica,
c. from 0.1 to 2.0 weight percent concentrated acid, and
d. from 0.05 to 1.5 weight percent dispersant,

and wherein said mixture comprises:

a. from 15 to 60 weight percent of an aggregate alumina-containing refractory of a relatively large particle size,
b. from 6 to 45 weight percent calcined alumina of a relatively small particle size,
c. from 5 to 20 weight percent graphite,
d. from 1 to 35 weight percent of a green strength binder material,
e. from 2 to 20 weight percent of said volatilized silica slurry, and
f. from 0 to 5 weight percent water.

4,093,471

GLASS FIBER REINFORCED CEMENT COMPOSITE MATERIALS

Ian Robert Kennedy Greig, Culcheth, Near Warrington, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Jul. 2, 1976, Ser. No. 701,787
Claims priority, application United Kingdom, Jul. 4, 1975, 28359/75
Int. Cl.[2] C04B *31/06*
U.S. Cl. 106—99 6 Claims

1. In a method of making a glass fibre reinforced cement composite material in which chopped strands of glass filaments are mixed into a cement slurry which is then poured into a mould and allowed to cure, the improvement which consists in first preparing the cement slurry without filaments from a cement/water mix by a high shear mixing process using a mixer to which the power input is at least 5 KW/100 Kg of slurry, so that cement agglomerates are broken up into their primary particles, and then adding the chopped strands of glass filaments into the cement slurry during a relatively low shear mixing process using a mixer to which the power input is 1 KW/100 Kg of slurry or less to avoid separation of the strands into individual, filaments.

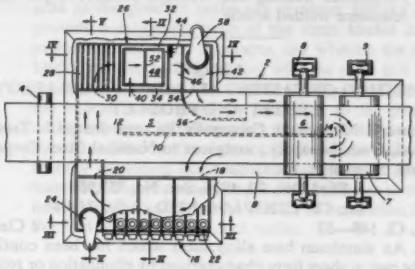
4,093,472

APPARATUS FOR CLEANING STRIP

Frederick S. Lukac, New Kensington, and William P. Zbryski, Tarentum, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Feb. 17, 1977, Ser. No. 769,496
Int. Cl.[2] B08B *3/10*
U.S. Cl. 134—104 6 Claims

1. Apparatus for cleaning strip in a molten salt bath, comprising a main tank for containing said molten bath, a central longitudinal baffle in said main tank, said baffle terminating short of the ends of said tank to provide passageways, a heating tank located along one side of said main tank adjacent the entry end thereof, a first opening from said main tank to the rear end of said heating tank, a second opening from said main tank to the lower forward end of said heating tank, heating tubes in said heating tank, bath circulating means in the forward end of said heating tank to circulate the heated molten bath from said heating tank through said forward passageway, a forward tank section located along the other side of said main tank at the entry end thereof, a third opening from said main tank to said forward tank section adjacent to the bottom thereof, an intermediate tank section located adjacent to the forward tank section, said intermediate tank section having upper and lower compartments, a rear tank section located adjacent said intermediate tank section, bath circulating means in said rear tank section, large openings from said lower compartment to said front and rear tank sections, relatively small openings between said upper compartment and said main tank and said rear tank section at least one adjacent the top thereof, means for directing said bath from said rear tank section rearwardly in said main tank, and means for directing said strip through said main tank below the level of said molten bath and above said longitudinal baffle.



4,093,473

SOLAR PANEL WITH UV ABSORBER

Joseph Lindmayer, 6919 Blaisdell Rd., Bethesda, Md. 20034

Continuation-in-part of Ser. No. 715,407, Aug. 25, 1976, Pat. No. 4,057,939. This application June 15, 1977, Ser. No. 806,868
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 P 10 Claims

1. A solar panel for maintaining solar energy cells in position to receive light impinging thereon, comprising a substrate on which said cells are mounted, a layer of silicone resin adhesively secured to said substrate and photovoltaic cells disposed within and encapsulated by said resin layer, said layer having distributed therein an ultraviolet light absorber in the form of a liquid or finely divided solid in an amount that will absorb sufficient ultraviolet light impinging on said layer to mitigate corrosion of metal parts of said cells and inhibit delamination of said resin from said substrate while having no adverse effect on curing of said resin.

4,093,474

METHOD FOR PREPARING ALUMINUM ALLOYS POSSESSING IMPROVED RESISTANCE WELDABILITY

Philip R. Sperry, North Haven, Conn.; William C. Setzer, Creve Coeur, Mo., and Lloyd E. Damon, Wallingford, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 703,781, Jul. 9, 1976, Pat. No. 4,043,840. This application Feb. 7, 1977, Ser. No. 765,982
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—2 7 Claims

1. A method for the preparation of wrought products which comprises:

A. providing an aluminum base alloy consisting essentially of from about 2.0 to about 6.0% magnesium, up to 0.40% iron, up to 0.40% silicon, and from about 0.03 to 0.20% vanadium, balance aluminum;
(B) casting said alloy;

(C) heating said alloy to a homogenizing temperature and thereafter homogenizing said alloy;
(D) hot and cold working said alloy;
(E) annealing said alloy whereby the vanadium is substantially retained in solid solution to provide a wrought produce exhibiting reduced electrical conductivity, increased electrical resistivity, improved resistance weldability plus good tensile properties, said wrought product being capable of plastic deformation; and
(F) resistance welding said wrought product to provide a resistance welded article.

4,093,475

METHOD OF CASTING ALUMINUM BASE ALLOY SHEET AND PRODUCT

Carmen C. Manzonelli, Coraopolis, Pa., and Joseph L. Tessandori, Owensboro, Ky., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,950
Int. Cl.[2] C22C *21/16*; B22D *11/06, 21/04*
U.S. Cl. 148—32 **4 Claims**

3. An aluminum base alloy sheet which has been continuously cast in sheet form characterized by elimination or reduction in edge cracking and a resultant elimination of or significant reduction in the necessity for edge shearing consisting essentially of the following composition:

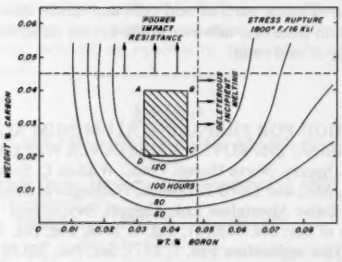
silicon from about 0.06 to about 0.30%, iron from about 0.45 to about 0.70%, manganese from about 0.35 to about 0.80%, magnesium from about 0.01 to about 0.29%, copper from about 0.10 to about 0.30% and the balance aluminum plus inconsequential amounts of other elements in which composition when the silicon and/or magnesium are on the low side of their ranges the iron and/or manganese are on the high side of their ranges, when the silicon is on the high side of its range the magnesium is on the low side of its range or the iron and/or manganese are on the high side of their ranges, when the magnesium is on the high side of its range the iron and manganese are on the high side of their ranges and when the magnesium is on the high side of its range and the iron and manganese are not on the high side of their ranges the silicon is on the low side of its range.

4,093,476

NICKEL BASE ALLOY

William J. Boesch, Utica, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,252
Int. Cl.[2] C22C *19/05*
U.S. Cl. 148—32.5 **8 Claims**



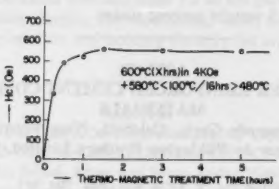
1. A gamma prime strengthened nickel base alloy consisting essentially of, by weight, from 12.0 to 20.0% chromium, from 4.0 to 7.0% titanium, from 1.2 to 3.5% aluminum, from 12.0 to 20.0% cobalt, from 2.0 to 4.0% molybdenum, from 0.5 to 2.5% tungsten, from 0.031 to 0.048% boron, from 0.005 to 0.045% carbon, up to 0.75% manganese, up to 0.5% silicon, up to 1.5% hafnium, up to 0.1% zirconium, up to 1.0% iron, up to 0.2% of rare earth elements that will not lower the incipient melting temperature below the solvus temperature of the gamma prime present in the alloy, up to 0.1% of elements from the group consisting of magnesium, calcium, strontium and barium, up to 6.0% of elements from the group consisting of rhenium and ruthenium, balance essentially nickel; said titanium plus said aluminum content being from 6.0 to 9.0%; said titanium and aluminum being present in a titanium to aluminum ratio of from 1.75:1 to 3.5:1; said alloy being substantially free of deleterious acicular, sigma and mu phases; said gamma prime being characterized as gamma prime which is substantially speroidal; said alloy being characterized by a highly desirable combination of hot corrosion resistance, strength, creep resistance, phase stability and stress rupture life; said desirable combination of properties being, in part, attributable to said boron content of from 0.031 to 0.048%.

4,093,477

ANISOTROPIC PERMANENT MAGNET ALLOY AND A PROCESS FOR THE PRODUCTION THEREOF

Masao Iwata, Chichibu, and Hisao Yoshizawa, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Nov. 1, 1976, Ser. No. 737,268
Int. Cl.[2] C21D *1/04*
U.S. Cl. 148—108 **18 Claims**



1. A thermo-magnetic-treated anisotropic permanent magnet alloy having a residual magnetic flux density of 7,000 Gauss or more and a coercive force of 300 Oersted or more, said anisotropic permanent magnet alloy being prepared by subjecting an alloy consisting essentially of 17 to 45% by weight of chromium, 3 to 14.5% by weight of cobalt, 0.2 to 5% by weight of silicon and a balance of substantially iron to a solution treatment at 600° to 1300° C., heating the alloy in a magnetic field at a temperature of 570° to 670° C. for a period of 10 minutes to 5 hours, and then aging the thermo-magnetic treated alloy at a temperature within 200° C. below the thermo-magnetic treatment temperature for a period of 30 minutes to 50 hours.

4,093,478

ACTIVATED AMMONIUM NITRATE EXPLOSIVE COMPOSITION

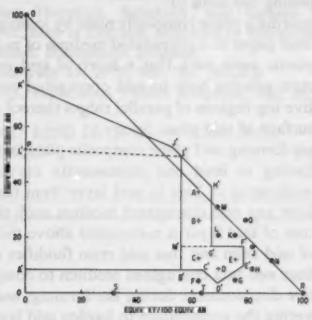
Gerald L. Hurst, Dallas, Tex., assignor to Tyler Holding Company, Dallas, Tex.

Continuation of Ser. No. 312,833, Dec. 7, 1972, which is a division of Ser. No. 79,096, Oct. 8, 1970, Pat. No. 3,722,410. This application Jan. 17, 1977, Ser. No. 759,948
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 **22 Claims**

1. An explosive mixture comprising:

activated porous ammonium nitrate prills which have a bulk density of less than about 0.80 grams per cubic centimeter and which have been activated by combining a minor nondissolving proportion of a solvent with ammonium nitrate prills having a bulk density of greater than about 0.80 and thereafter heating the prills to an elevated tem-

perature and evaporating substantially all of the solvent from the prills,



a fuel selected from a liquid hydrocarbon derivative having an oxygen equivalent weight less than about 4 grams per equivalent,

said mixture detonable by a commercial number 6 cap.

4,093,479

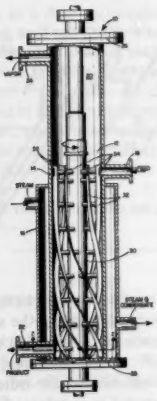
THIN-FILM PROCESSING APPARATUS AND METHOD

James L. Baird, Winchester, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Continuation of Ser. No. 587,995, Jun. 18, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,196

Int. Cl.[2] B01D *1/22*

U.S. Cl. 159—6 W **8 Claims**



1. In a fluid-processing apparatus of the wiped thin-film type, which apparatus comprises in combination:

(a) a substantially vertical closed chamber characterized by an interior wall defining a heated surface of revolution;

(b) a rotor shaft within the chamber;

(c) means to rotate the rotor shaft;

(d) a feed inlet at the upper part of the chamber for the introduction of feed material;

(e) a product outlet remotely spaced apart and downstream from the feed inlet for removal of product material;

(f) a vapor chamber within the closed chamber and upstream of the feed inlet;

(g) a vapor outlet in the vapor chamber for the removal of vapor; and

(h) a plurality of rotor blades secured to the rotor shaft for rotation therewith, the blades having a one end and another end, and radially and axially arranged from the rotor shaft and extending into a thin-film-forming relationship with the interior wall, said blades extending from the vicinity of the feed inlet to the vicinity of the product outlet, the peripheral edges of said blades being smooth along their length, the improvement which comprises

the rotor blades characterized by a helical twist therein from the one to the other end of the blades, and the helical twist of such blades varying continuously and nonsymmetrically from one to the other end, the total helical twist of the rotor blades increasing from the feed inlet to the product outlet, up to about 180° so as to provide a maximum twist of the rotor blades at the product outlet of the apparatus, and wherein the rotor blades are substantially aligned with the rotor axis at or about the feed inlet, and wherein the degree of twist of the helical blades from the feed inlet to the product outlet increases in relationship to the film thickness of the thin film on the interior wall of the chamber, thereby providing good agitation of the thin film of material being processed, as the film decreases in thickness by evaporation, on the surface of revolution from the feed inlet to the product outlet.

4,093,480

METHOD FOR MAKING ELECTRICAL CONNECTORS

Donald Raeford Blalock, McLeansville, and Julian Lesco Carrington, III, Greensboro, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 513,686, Oct. 11, 1974, abandoned. This application Apr. 21, 1976, Ser. No. 678,804

Int. Cl.[2] H01B *13/06, 13/26*

U.S. Cl. 156—54 **5 Claims**

1. A method of manufacturing electrical connectors comprising the steps of:

continuously axially feeding a substantially endless strand of firm, solid elastomeric material which has a Shore A hardness of about 53 and which has a non-yielding core to which the elastomeric material is bonded along a first predetermined path through a folding zone, a bonding zone, and a cutting zone,

continuously feeding a substantially endless flat strip of insulating film along a second predetermined path which extends towards, and merges with, said first predetermined path at the beginning of said folding zone, said strip having a width which is greater than the circumference of said strand and having transversely extending spaced apart conductors adhered to the one side thereof which faces away from said first path,

said feeding steps being carried out by means of an endless belt which is moved continuously along said second predetermined path and which supports said film during movement through said folding and bonding zones,

progressively folding said plastic strip and said belt around said strand in said folding zone and locating marginal side surface portions of said strip against each other and slightly compressing said strand in a direction extending normally of its axis without elongation of said strand during final stages of said folding step so that said strip has a snug fit on said strand,

bonding said marginal side surface portions to each other in said bonding zone, and

cutting through said film and said strand at periodic time intervals as said strand passes through said cutting zone whereby,

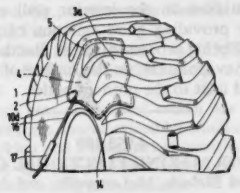
electrical connectors each comprising an elastomeric body having a film wrapped therearound and having spaced apart circumferentially extending conductors on the external surface of said film and produced serially.

4,093,481

METHOD FOR RETREADING AND REPAIRING VEHICLE TIRES

Wilhelm Schelkmann, Witten, Germany, assignor to Vakuum Vulk Holdings Limited, Nassau, Bahamas

Filed Jan. 28, 1976, Ser. No. 653,240
Claims priority, application Germany, Jan. 31, 1975, 2503973
Int. Cl.[2] B29H *17/36*
U.S. Cl. 156—95 **10 Claims**



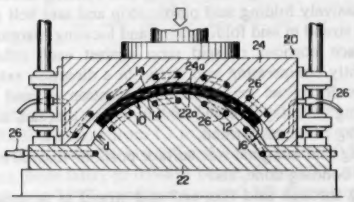
1. A method for repairing a vehicle tyre comprising the steps of:
- filling a repair region of the tyre with vulcanisable binding rubber material,
- applying a flexible cover to the rubber filled region,
- attaching the flexible cover to the tyre with an adhesive that can withstand the vulcanisation temperature of the rubber filling around the border of the flexible cover to provide a seal between the flexible cover and the tyre,
- piercing the flexible cover with a hollow suction needle at at least one point over the repair region where air or other gas or vapour has accumulated within the repair region,
- evacuating the air or other gas or vapour from the repair region at each of said points by applying a suction through the needle,
- removing the needle from the flexible covering at each of said points after the air or other gas or vapour has been evacuated,
- sealing off the puncture opening in the flexible cover made by the needle at each of said points,
- heating the repair region to vulcanise and bond the rubber filling to the tyre.

4,093,482

HEAT AND SOUND INSULATOR OF CURVED CORRUGATED PAPERBOARD AND METHOD OF SHAPING SAME

Mitsutoshi Ogata, and Norinao Naito, both of Fukuoka, Japan, assignors to Nissan Motor Company Limited and Fukuoka Paper Company, Limited, both of, Japan

Filed May 14, 1976, Ser. No. 686,314
Claims priority, application Japan, May 15, 1975, 50-58137
Int. Cl.[2] B32B *3/28, 1/00*
U.S. Cl. 156—210 **6 Claims**



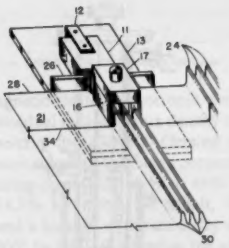
1. A method of shaping a heat and sound insulating plate member of corrugated paperboard to form a plate member having at least one permanently curved portion, the method comprising the steps of:
- preparing a plane composite plate by joining a sheet of plane liner paper to a corrugated medium of paper by a thermoplastic resin such that a layer of said resin in hardened state adheres both to said corrugated medium at respective top regions of parallel ridges thereof and to the inside surface of said plane liner;
- press-forming said plane composite plate into a desired shape having at least one permanently curved portion with application of heat to said layer from the outside of said liner and said corrugated medium such that the temperature of said layer is maintained above the softening point of said resin and that said resin fluidifies and permits said liner and said corrugated medium to compensate for relative displacement during the forming; and
- lowering the temperature to harden said layer in the shaped plate member whereby the shaped plate member is free from such internal strains as cause spontaneous deformation of the plate member.

4,093,483

PROCESS AND APPARATUS FOR FORMING PLEATS IN A DRAW DRAPE

Lawrence O'Quinn Jacobs, Richmond, Va., assignor to Plastic Products, Inc., Richmond, Va.

Filed Feb. 9, 1977, Ser. No. 767,100
Int. Cl.[2] B31F *1/00;* D06J *1/00*
U.S. Cl. 156—227 **18 Claims**



11. Process for the production of a straight uniform pleat in the heading of a drapery comprising the steps of:
- (a) positioning a piece of a sheet backing material on an essentially flat surface of a positioning means contoured so as to completely encompass the outer periphery of said sheet backing material in a substantially horizontal, motionless disposition,
- (b) positioning fold-forming means above said backing material,
- (c) placing the heading of a drapery having a front surface and a rear surface over said fold-forming means in a manner such that said front surface faces upward, and said rear surface contacts said fold-forming means,
- (d) forming folds in said heading by causing said fold-forming means to interengage with a shaping means brought vertically downward onto the front surface of the heading,
- (e) causing the bottoms of said folds to contact said backing material in straight line regions,
- (f) cohesively bonding the bottoms of said folds to said backing material within said straight line regions in abutment with said flat surface to form a finished pleat,
- (g) raising said shaping means, and
- (h) removing said fold-forming means from said pleat.

4,093,484

METHOD OF MAKING SURGICAL CATHETERS AND TUBES

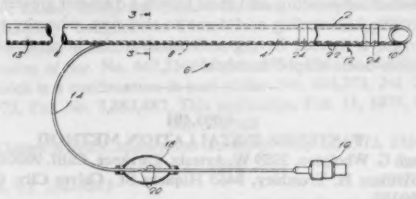
Reginald William Harrison, Salisbury, and George Albert Peach, Andover, both of England, assignors to Warne Surgical Products Limited, Hampshire, England

Filed July 14, 1976, Ser. No. 705,336

Claims priority, application United Kingdom, Jul. 16, 1975, 29903/75

Int. Cl.² B29D *23/03, 23/04;* B32B *31/30*

U.S. Cl. 156—244.13 7 Claims



1. A method of forming a cuff on a self-retaining catheter, said method comprising the steps of

providing a catheter having a tubular shaft, a passage extending inside and along the length of the wall of said shaft, and a hole extending between said passage and the outside surface of said shaft in proximity to the distal end of said shaft,

extruding a thin-walled tube of thermoplastic material,

fitting said tube onto said tubular shaft at the distal end thereof at a position where said tube overlies said hole,

bonding the ends of said tube to said tubular shaft, and, thereafter,

heating said tube to a first temperature to soften said tube and surrounding said tube with a mould, then

injecting a fluid into said tube via said passage and said hole so as to cause said tube to expand and adopt the shape of said mould, then

heating said mould to a second temperature higher than said first temperature, said second temperature being sufficient to allow flow of said thermoplastic material, then

cooling said mould to cause said tube to retain its expanded shape, and then

allowing the fluid in said tube to escape and removing the mould.

4,093,485

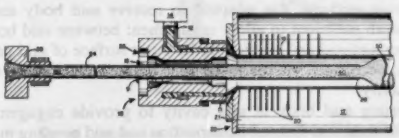
METHOD FOR FORMING A HOT MELT ADHESIVE CARTRIDGE

Robert L. Ornsteen, Shore Rd., Cape Neddick, Me. 03902

Filed May 31, 1977, Ser. No. 801,846

Int. Cl.² B29D *23/04*

U.S. Cl. 156—244.13 7 Claims



1. A method for continuously forming a hot melt adhesive cartridge of accurate outside dimension and having a non-stick, thermoplastic outer sleeve comprising the following steps:

continuously extruding a hollow sleeve of non-stick, thermoplastic material;

sizing said continuously extruded sleeve to a predetermined outside dimension;

cooling said sleeve to a solidified set condition; and

introducing a hot melt adhesive material into said hollow sleeve by dispensing such material at a point downstream from the initial extrusion of said sleeve, at which point the sleeve has been cooled to a substantially solidified set condition.

4,093,486

METHOD AND APPARATUS FOR MANUFACTURING AN EVEN LAMINATED PRODUCT BY EXTRUSION

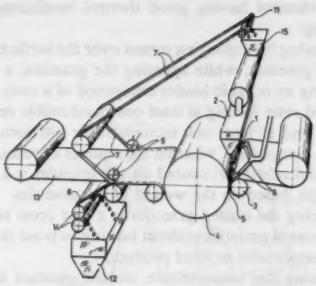
Arto Honkanen, Helsinki, and Erkki Laiho, Kulloo, both of Finland, assignors to Pekema OY, Helsinki, Finland

Filed Aug. 25, 1976, Ser. No. 717,511

Claims priority, application Finland, Sep. 4, 1975, 752496

Int. Cl.² B29G *3/02*

U.S. Cl. 156—244.19 17 Claims



1. A method for manufacturing an even laminated product by extruding a molten thermoplastic coating-material track onto a basic-material track comprising the steps of cooling the edge strips of said coating-material track by means of jets of heat absorbing material to keep said edge strips from adhering to edge strips of said basic-material track, said strips of each of said tracks being cut off said tracks along predetermined boundary lines, chopped separately, and directed separately for recovery.

4,093,487

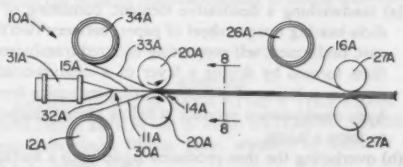
METHOD OF CONTINUOUSLY MAKING A PRINTING BLANKET CONSTRUCTION

Andrew J. Gaworowski, Waynesville, and Wayne W. Easley, Clyde, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Nov. 15, 1976, Ser. No. 742,165

Int. Cl.² B29D *7/14*

U.S. Cl. 156—244.16 4 Claims



1. A method of continuously making a printing blanket construction comprising the steps of, supporting a fabric substrate web in coil form for unwinding rotation, unwinding and moving a forward portion of said substrate web through a laminating station, continuously laminating a thermoplastic polymeric layer against said substrate web at said station, continuously bonding a reinforcing layer against said polymeric layer, and continuously calendering a printing face against said reinforcing layer.

4,093,488

PROCESS FOR THE PRODUCTION OF BUILDING MATERIAL ELEMENTS, PARTICULARLY BUILDING BOARDS

Kurt Kirsch, Vienna; Volkmar Hilzensauer, Amstetten; Gunther Pflug, Vienna; Felix Wehrmann, Vienna, and Gerald Maresch, Vienna, all of Austria, assignors to Isovolta Osterreichische Isolierstoffwerk Aktiengesellschaft, Wiener Neudorf, Austria

Division of Ser. No. 450,847, Mar. 13, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,273

Claims priority, application Austria, Mar. 16, 1973, 2385/73; Dec. 12, 1973, 10381/73; Feb. 21, 1974, 1400/74

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—245 5 Claims

1. A process for the production of an incombustible building material element having good thermal insulation properties comprising

(a) spraying by a spraying means over the surface of vermiculite granules, while agitating the granules, a liquid containing an organic binder comprised of a resin mixture or mixed resin having at least one combustible resin component and at least one incombustible nitrogen-containing resin component, wherein the amount of resin, calculated as solid substance, coated on the granules is 2 to 30% by weight, based on the weight of the granules,

(b) placing the coated granules in a first press and pressing the coated granules without heating to bond them to form a transportable molded product,

(c) placing the transportable molded product in a second press provided with a heating means, and

(d) pressing and heating the transportable molded product at an elevated temperature to further bond the granules and organic binder in the molded product to form an incombustible building material element with good thermal insulation properties.

4,093,489

PROCESS FOR LAMINATING PHOTOGRAPHS AND THE LIKE INTO MOLDED ARTICLES OF MELAMINE-FORMALDEHYDE RESIN

Kwang Kil Hong, Rte. 2, Box 141, Colonial Beach, Va. 22443

Filed Sep. 22, 1976, Ser. No. 725,650

Int. Cl.[2] B29C *19/00;* B44F *7/00*

U.S. Cl. 156—245 7 Claims

1. A process for the production of a rigid molded decorative assembly comprising a decorative element embedded in melamine-formaldehyde resin, comprising the steps of:

(a) sandwiching a decorative element, consisting of an indicia-bearing opaque sheet of paper, between two flexible cast, preformed, self-supporting uncured translucent resin films formed by drying a layer of a catalyst-containing aqueous solution of a thermosetting melamine-formaldehyde condensation product at below curing temperature, to form a layup;

(b) overlaying the thus-produced layup onto a surface of a flexible three-dimensional molded article formed of a catalyst-containing partially-cured melamine-formaldehyde filled molding resin, with the indicia-bearing surface of the sheet of paper facing away from the molded article, to form an assembly; and

(c) curing the melamine-formaldehyde condensation product completing the cure of the partially-cured molding resin, conforming the layup to the shape of the molded article and bonding the layup thereto by heating the thus-produced assembly under pressure in a mold, to produce the rigid decorative assembly.

4,093,490

METHOD OF MAKING VAGINAL DIAPHRAGM

George A. Ziets, Bound Brook, and Bernard L. Williams, Martinsville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Apr. 29, 1977, Ser. No. 792,383

Int. Cl.[2] B29F *1/00*

U.S. Cl. 156—245 7 Claims

1. The method of making a diaphragm comprising center injection molding a rim from a thermoplastic elastomer, deforming a sheet of a thermoplastic elastomer into a dome at an elevated temperature, said sheet having a diameter greater than said ring, and sealing said dome to said ring, whereby a diaphragm is formed having a continuous rim integral with a flexible dome-shaped membrane.

4,093,491

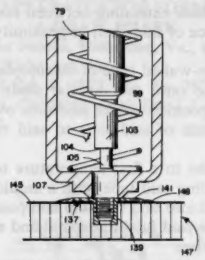
FASTENER INSTALLATION METHOD

Hugh G. Whelpton, 2059 W. Artesia, Torrance, Calif. 90504, and William H. Trembley, 8463 Hiquera St., Culver City, Calif. 90230

Continuation-in-part of Ser. No. 156,406, Jun. 24, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,097

Int. Cl.[2] C09J *5/00;* B32B *3/12, 27/34*

U.S. Cl. 156—309 8 Claims



1. A method of installing a fastener insert to a panel having a cavity extending thereinto from one face thereof, the method comprising the following steps in combination:

providing a fastener insert having an axially extending body and a flanged heat conductive head portion integrally formed at one end of the body;

providing on an undersurface of said flange synthetic resin bonding material which is solid at room temperature, melts at an elevated temperature and resolidifies on cooling to bond adjacent structures;

providing a heating tool having an operating temperature substantially above the melting temperature of said bonding material;

providing a panel having a cavity, said cavity having a cross-sectional size adapted to receive said body and a depth sufficient to allow engagement between said bonding material and portion of the outer surface of said panel adjacent said cavity when said body is inserted in said cavity;

inserting said body in said cavity to provide engagement between said flanged head portion and said bonding material and between said bonding material and said outer surface portions of said panel;

transferring heat from said heating tool to said fastener insert and to said bonding material by placing said heating tool in proximity to said insert, and thereby melting said bonding material;

said bonding material being characterized by yielding increased bonding strength between said insert and panel after cooling upon an increase in the time of heat transfer from said heating tool beyond the time required to melt said bonding material, and up to a maximum time, beyond

which said maximum time the bonding strength of said bonding material deteriorates, and

stopping the heating of said bonding material after melting thereof at a time to effect a resulting bonding strength which is approximately the maximum bonding strength of said bonding material.

4,093,492

COPOLYAMIDES CONTAINING CAPROLACTAM, LAURICLACTAM AND 11-AMINOUNDECANOIC ACID

Fritz Raabe, Bonn, and Eduard De Jong, Bonn-Beuel, both of Germany, assignors to Plate Bonn Gesellschaft Mit Beschrankter Haftung, Bonn, Germany

Division of Ser. No. 467,234, May 6, 1974, Pat. No. 3,948,844, which is a continuation-in-part of Ser. No. 384,371, Jul. 31, 1973, Pat. No. 3,883,487. This application Feb. 11, 1975, Ser. No. 548,965

Claims priority, application Germany, May 12, 1973, 2324160

Int. Cl.[2] C09J *5/06*

U.S. Cl. 156—331 **12 Claims**

1. A process for heat-sealing together surfaces of materials comprising applying to at least one of the surfaces to be sealed a composition comprising a copolyamide having a melting range below about 110° C and consisting essentially of recurring units of caprolactam, lauriclactam, 11-aminoundecanoic acid and a hexamethylene diamine salt of an aliphatic dicarboxylic acid of the formula:

$$HOOC—(CH_2)_n—COOH \quad (I)$$

in which n is 4, 7, 8, 10 or 11, joining said surfaces, heating the materials to be sealed to a temperature sufficient to melt the copolyamide and cooling the materials.

4,093,493

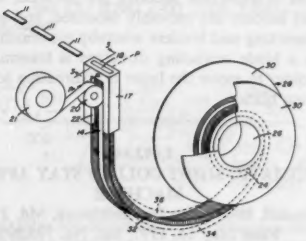
APPARATUS FOR FORMING A PHOTOGRAPHIC POD-TAPE PRODUCT

Richard D. Welch, Pittsford, and John E. Iversen, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 483,586, Jun. 27, 1974, abandoned. This application Sep. 19, 1975, Ser. No. 615,031

Int. Cl.[2] B32B *31/20, 31/10*

U.S. Cl. 156—358 **5 Claims**



1. In an apparatus for adhering rupturable photographic pods onto a tape to form a photographic pod-tape product in which each pod comprises a pair of facing rectangular walls formed of deformable sheet material and secured to one another at their marginal edges to form a cavity for a liquid photographic processing agent, the combination comprising:

an elongated pod collecting chute having entry and exit openings and a first slot along one side for exposing corresponding edges of a plurality of pods fed therein through said entry opening;

said chute having a portion of a width less than the width of a pod so that any pod fed therein through said entry opening is tilted at an angle to a plane perpendicular to the longitudinal axis of said chute; and

means extending into said first slot for simultaneously (1) applying the adhesive surface of a tape trained over a portion of said tape applying means into engagement with said corresponding edges of said pods to form said pod-tape product, and (2) transporting said product from said chute through said exit opening.

4,093,494

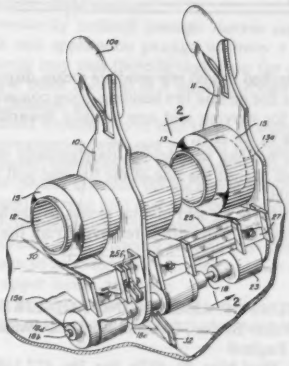
SECURING MEANS FOR PARQUET FLOOR BOARDS

William A. Boettcher, 4507 N. Clark St., Chicago, Ill. 60640

Filed May 9, 1977, Ser. No. 795,171

Int. Cl.[2] B44C *7/00*

U.S. Cl. 156—577 **2 Claims**



1. Securing means for parquet boards designed to be laid on a floor, comprising a machine adapted to travel in a direct course on the floor, transverse cylinder means mounted in the machine and carrying a series of rotatable rolls from which tapes adhesive on the under side may be drawn to adhere to the floor during said travel, the tapes showing a protective covering on the upper side when laid, and such covering removable to allow the parquet boards to be laid on said upper side into adhering engagement with the tapes, the machine having a pair of side walls receiving said cylinder means between them, a frontal tie bar carried by said walls, channel plates carried by the tie bar in line with the tapes, and means to adjust the channel plates according to lateral adjustments of the tapes.

4,093,495

APPARATUS FOR REMOVING A TIRE FROM A BUILDING DRUM OF A TIRE BUILDING MACHINE

Bruno Colombani, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jun. 24, 1977, Ser. No. 809,761

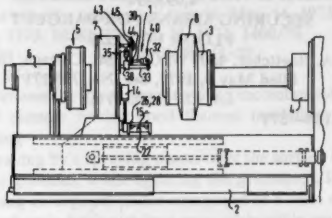
Claims priority, application Italy, Jun. 28, 1976, 24790/76

Int. Cl.[2] B29H *17/00*

U.S. Cl. 156—394 **12 Claims**

12. In a tire building apparatus having longitudinally spaced breaker building-drum and tire building drum and means intermediate the two drums for transferring a breaker structure from the breaker building-drum to the tire building drum by back and forth movement therebetween, a means mounted on said intermediate means facing said tire building drum for removing a tire from the tire building drum which comprises

means movably attached to said intermediate means for movement substantially perpendicularly with respect to the axis of the tire building drum disposed to move below a tire on the tire building drum and comprising a frame having a generally arcuate contour corresponding to a segment of the peripheral surface of a tire, means pivotably mounted on the frame having rollers disposed to contact the tire when the frame is disposed below the tire, means for moving the said frame into contact with the tire,



means attached to said intermediate means disposed near the top of a tire on said tire building drum comprising an arm, means for moving said arm radially inwardly to against the side of the tire,

means for moving said device longitudinally with said arm disposed against the side of the tire and pull the tire from the drum, and

means for pivoting said pivotal means to discharge the tire therefrom after the tire is removed from the drum.

4,093,496

APPARATUS FOR ASSEMBLING ROD-LIKE ARTICLES

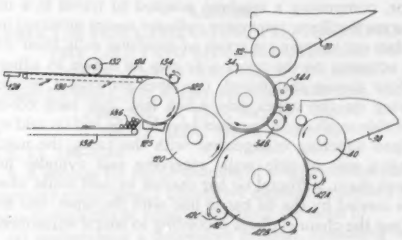
Desmond Walter Molins, London, England, assignor to Molins Limited, England

Filed Mar. 31, 1976, Ser. No. 672,148

Claims priority, application United Kingdom, Apr. 4, 1975, 13823/75

Int. Cl.[2] B65C *9/04*

U.S. Cl. 156—449 **2 Claims**



1. Apparatus for making composite filter rod, comprising means to feed successive groups each consisting of several axially aligned component filter portions, said means including at least one conveyor provided with flutes for supporting and conveying filter rods in a direction transverse to their lengths; means for cutting the rods into portions, the flutes of said conveyor being provided with additional lateral support means for said rods in the region where they are cut by said cutting means; means for subsequently axially spacing the portions apart to form a sub-group of component filter portions; means to feed a web of uniting material; slitting means to slit the web continuously longitudinally into a plurality of strips; guide means for changing the directions of travel of said strips and for spacing the strips apart; means for successively cutting portions from the strips to provide a plurality of uniting bands; and means for wrapping the uniting bands around the end portions of each adjacent pair of component filter portions of a group to join said portions into a composite filter rod; wherein the means for axially spacing the portions apart includes at least one stationary guide, including means for displacing a rod in its flute so that it projects beyond said lateral support means for engagement by the stationary guide.

4,093,497

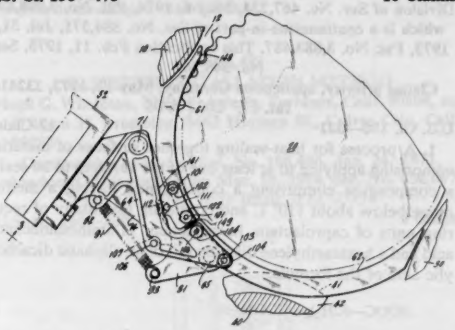
SELF RETRACTING STRIPPER FINGER FOR CORRUGATING MACHINE

Martin J. Leff, New York, N.Y., assignor to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed May 12, 1977, Ser. No. 796,188

Int. Cl.[2] B31F *1/00*

U.S. Cl. 156—473 **10 Claims**



1. Web corrugating apparatus including first and second rotating corrugating rollers operatively in mesh at a corrugating nip through which a flat web passes to be transformed into a corrugated web, a pressure roll operatively disposed adjacent said first corrugating roll at a pressure nip through which the corrugated web and another flat web pass and are joined to form single faced board, a plurality of transversely spaced finger means having arcuate surfaces operatively positioned to support the corrugated web in the region between said nips, each of said finger means including an upstream and a downstream section generally aligned in a plane parallel to the rotational axis of the corrugating rollers, biasing means urging arcuate surfaces of said sections toward said first corrugating roll, a first and a second holder to which the respective upstream and downstream sections are secured, a support to which said holders are movably mounted, and means operatively connecting said holders whereby movement of said first holder in a blade retracting direction is transmitted to said second holder to move the latter in a direction to retract said downstream blade.

4,093,498

AUTOMATIC SHIRT COLLAR STAY APPLYING MACHINE

David Wendell, 8803 Kelso Dr., Baltimore, Md. 21221

Filed May 11, 1977, Ser. No. 795,891

Int. Cl.[2] A41H *43/00*

U.S. Cl. 156—494 **5 Claims**

1. A machine for adhesively attaching a stiffening stay to the end sections of collar materials wherein the stiffening stays are provided with a heat sensitive adhesive on at least one side thereof, comprising:

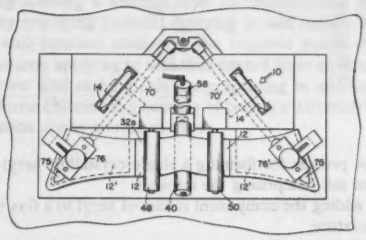
a. a frame for supporting said machine;

b. a pair of spaced collar or liner material supporting members spaced apart and in substantially the same plane and of substantially the same contour as the end of a collar or liner material, said supporting members being of such thickness as to be receivable between at least two layers of the collar or liner material;

c. a collar or liner tightening member positioned on said frame between the two collar or liner material supporting members having means for engaging the said collar or liner material and moving the same in a plane perpendicular to the plane of the collar or liner material supporting members for moving the end portions of the collar or liner material inwardly against the ends and outer edges of the said collar or liner supporting members;

d. said stays being formed of a flexible polyester plastic;

e. a pair of spaced magazines for carrying a stack of stays in each of said magazines adjacent the ends of said collar or liner materials supporting members;



f. means for automatically placing a single stay from each stack in position on the collar or liner material supporting means adjacent each end of the collar or liner material;

g. heating means positioned adjacent the location of the stays positioned on the collar or liner material, and means for moving the heating means in close proximity of the said stays and means for supplying heat to the said stays for a predetermined period to soften the said adhesive carried thereon sufficiently to adhesively bind the stays to the collar or liner material.

4,093,499

APPARATUS FOR PRODUCING FLEXIBLE NON-SKID STRIP

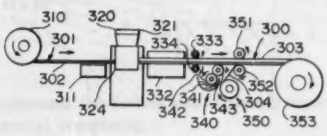
Hiromitsu Naka, No. 39, Caza Shinmachi, Yashio-shi, Saitama-ken, Japan

Continuation of Ser. No. 557,886, Mar. 12, 1975, abandoned, which is a division of Ser. No. 483,005, Jun. 25, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 742,115

Claims priority, application Japan, Jul. 16, 1973, 48-79785

Int. Cl.[2] **B29G** *3/00, 3/06, 3/08*

U.S. Cl. 156—498 **3 Claims**



1. An apparatus for continuously producing a flexible non-skid strip having a lower layer and an upper non-skid layer, said apparatus consisting essentially of

feed means for continuously feeding a continuous length of sheet material which forms said lower layer from a supply roll, said sheet material being of a material selected from the group consisting of aluminum, copper, steel and stainless steel;

forming means for receiving said sheet material from said feed means comprising upper and lower forming rolls having a peripheral surface shape for continuously making a plurality of spaced holes in the sheet material in the longitudinal direction thereof with arcuate projections on the upper surface of said sheet material bridging each of the holes;

heating means for receiving said sheet material from said forming means and heating said sheet material;

an extruding die including

a straight application passage having an inlet for receiving said sheet material containing the spaced holes and arcuate projections thereupon at one end and an outlet at the other end, wherein a fused plastic material is integrally extruded onto the upper surface of said sheet material moving into said application passage as the sheet material passes through the application passage and wherein said fused plastic material is simultaneously permitted to flow into said holes of the sheet material moving into said application passage and to become integrally embedded in said arcuate projections on said sheet material;

a straight sheet passage communicating with the inlet of said application passage extending in the longitudinal direction of said application passage, and guiding said sheet material from said heating means to said inlet of the application passage,

a downwardly inclined passage therein communicating with said application passage whereby a fused plastic material may pass therethrough onto the upper surface of said sheet material as it passes through said application passage, and

a manifold located above said sheet passage and therein communicating with said inclined passage;

an extruder connected to said manifold for feeding said fused plastic material through said manifold and said inclined passage into said application passage for integrally forming the upper layer under pressure onto the perforated sheet material moving into said application passage so as to form an extruded product on the lower and upper layers; and

cooling means for receiving the thus-formed product and continuously cooling said extruded product.

4,093,500

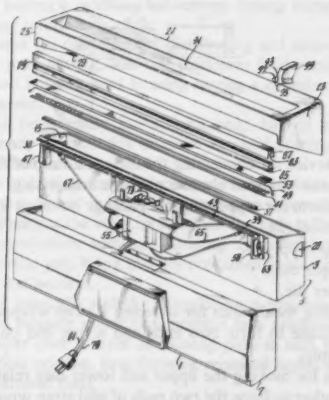
BAG FORMING APPARATUS

Thomas J. Browne, Birmingham, Mich., assignor to Lehigh Valley Industries, Inc., New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,778

Int. Cl.[2] **B26D** *5/08;* **B30B** *15/34*

U.S. Cl. 156—510 **16 Claims**



1. An apparatus for making plastic bags from multilayered tubular plastic film comprising a housing including a front edge portion; a compartment in said housing for said tubular film, a substantially continuous elongated base rigidly secured to and substantially spanning the length of said front edge of the housing, said elongated base having a plurality of spaced integral ridges; a wire element supported by said spaced ridges of

said elongated base; a first insulating strip overlying said wire; an electrical circuit including a switch, said electrical circuit having terminals connectable to said switch and to an external power source; means in said lid for actuating said switch when said lid is closed; a second insulating strip in said lid which is substantially coextensive with and overlies said first insulating strip when said lid is closed; an elongated channel in said lid substantially coextensive with and parallel to said second insulating strip and a cutting means slideably mounted in said channel for severing the plastic bags from said tubular film.

4,093,501

FRICTIONAL HEAT WELD

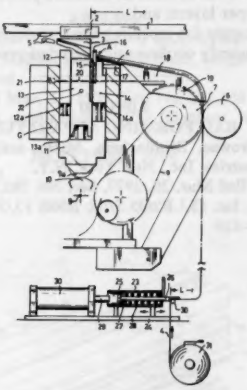
Dirk Adriaan van Staveren, Moerkapelle, Netherlands, assignor to N. V. Technische Maatschappij Marchand-Andriessen, Rijswijk, Netherlands

Filed Oct. 7, 1976, Ser. No. 730,329

Claims priority, application Netherlands, Oct. 10, 1975, 7511929

Int. Cl.² B32B *31/20*

U.S. Cl. 156—580 **5 Claims**



1. A device for connecting the ends of a strap of thermoplastic material wrapped about a package comprising

a platform for supporting the package having a longitudinal vertical slit,

a strap supply,

an upper die,

a lower die,

a cutting mechanism for severing a strap wrapped about a package to form two ends and a free end on said strap supply,

means for moving the upper and lower dies relative to one another to force the two ends of said strap wrapped about a package toward one another,

means for inserting the free end of said strap supply between the two ends of said strap wrapped about said package,

and means for moving said free end longitudinally of said two strap ends when the two strap ends and said free end are forced together by said means for moving said upper and lower dies together.

4,093,502

PROCESS FOR SYNTHESIZING AND GROWING SINGLE CRYSTALLINE BERYL

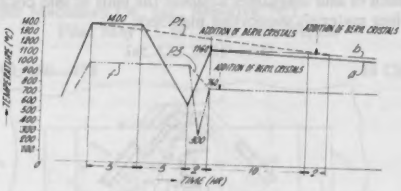
Masaya Hirabayashi, Yokaichi; Naoki Omi; Yuji Nakano, both of Kyoto, and Tetsuro Oshiba, Yokaichi, all of Japan, assignors to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Filed Feb. 12, 1976, Ser. No. 657,595

Claims priority, application Japan, Feb. 18, 1975, 50-20692

Int. Cl.² B01J *17/04*

U.S. Cl. 156—624 **27 Claims**



1. A process for forming a single crystalline beryl out of a molten salt comprising the steps of:

(a) adding the component oxides of beryl to a flux to form a mixture;

(b) heating said mixture to a temperature higher than the melting point of said flux so as to form a molten salt;

(c) cooling said molten salt to a temperature below the temperature of beryl formation;

(d) reheating said salt to the upper temperature region of beryl formation for a sufficient length of time so as to preferentially form single crystalline beryl; and

(e) cooling said salt and recovering said single crystalline beryl therefrom.

4,093,503

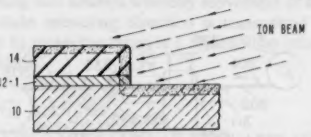
METHOD FOR FABRICATING ULTRA-NARROW METALLIC LINES

Erik Preston Harris, Yorktown Heights, and Robert William Keyes, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,335

Int. Cl.² C23F *1/02*

U.S. Cl. 156—628 **4 Claims**



1. A method for fabricating ultra-narrow metal lines on a supporting substrate comprising the steps of:

applying a thin metal film on the surface of a substrate,

covering selected portions of said thin metal film with masking material to delineate a desired pattern,

removing the unmasked portions of said thin metal film,

selectively ion implanting the edges of said remaining masked portions of said thin metal film to predetermined desired depth,

removing said masking material from said remaining portions of said thin metal film,

and removing by selective etching the unimplanted portions of said thin metal film to provide a pattern of ultra-narrow metal lines on said substrate.

4,093,504

METHOD FOR PRODUCING ELECTRICALLY CONDUCTIVE INDIUM OXIDE PATTERNS ON AN INSULATING SUPPORT BY ETCHING WITH HYDROCHLORIC ACID AND FERRIC CHLORIDE

Johannes J. Ponjeé, and Hendrik J. Feil, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 712,040
Claims priority, application Netherlands, Jun. 8, 1975, 7509341
Int. Cl.² C23F 1/02
U.S. Cl. 156—656 2 Claims

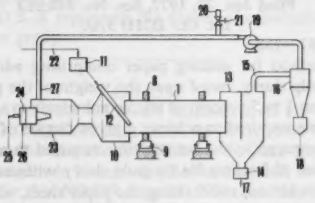
1. A method of producing an electrically conductive pattern comprising forming a uniform layer of indium oxide on an electrically insulating support, applying to said indium oxide layer an etch-resistant coating in the negative image of the desired pattern, applying to said thus coated layer an aqueous hydrochloric acid etching solution containing in addition to the acid, ferric chloride in a quantity of between 0.01 mol/l and the saturation concentration thereof.

4,093,505

METHOD AND APPARATUS FOR HEATING AND REMOVING MOISTURE FROM WATERY MATERIAL

Hidemasa Tsuruta, Tokyo; Shoji Itoh, Chiba; Masayuki Otsuka, and Naoki Shimizu, both of Tokyo, all of Japan, assignors to Nittetu Chemical Engineering Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,160
Claims priority, application Japan, Oct. 4, 1975, 50-119371
Int. Cl.² B01D 1/22
U.S. Cl. 159—9 A 10 Claims



4. An apparatus for heating and removing moisture from watery material, comprising:

a rotatably supported drum of cylindrical shape having an inlet and an outlet at opposite ends;

a plurality of perforated partitions dividing said drum into a number of longitudinally extending compartments for accommodating packing elements including a center compartment and circumferential compartments around said center compartment each compartment retaining packing elements therein, said perforated partitions all allowing passage of the watery material while blocking passage of the packing elements;

a feeding duct extending to said inlet of said drum for feeding watery material thereto;

means for introducing a hot gas axially through said drum; and

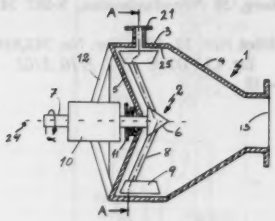
means for removing exhaust gas from said drum.

4,093,506

METHOD AND APPARATUS FOR EFFECTING EVEN DISTRIBUTION AND MIXING OF HIGH CONSISTENCY PULP AND TREATMENT FLUID

Johan C. F. C. Richter, Nice, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Mar. 10, 1976, Ser. No. 665,576
Claims priority, application Sweden, Mar. 14, 1975, 7502870
Int. Cl.² D21C 7/14, 9/12, 9/14, 3/24
U.S. Cl. 162—17 10 Claims



1. A method for continuously distributing and mixing high consistency pulp with at least one treatment fluid in a housing having a cylindrical portion comprising the steps of

introducing pulp having a solids content of about 5% or more into the housing cylindrical portion,

imparting a rapid circular movement about an axis of rotation to said pulp, corresponding to a linear peripheral velocity at the velocity at which the pulp is fluidized, after introduction into said housing cylindrical portion, said moving pulp being contained by said housing cylindrical protion,

introducing treatment liquid in the housing cylindrical portion in a predominantly even layer over a layer of moving pulp in said housing cylindrical portion, thus forming repeated layers of pulp and treatment fluid,

transforming the circular movement of said pulp having a layer of treatment fluid into a whirling movement translating along said axis of rotation of said pulp, so that displacement between the pulp layers takes place effecting complete mixing of said pulp and said treatment fluid, and

transporting the now mixed pulp and treatment fluid to another treatment station, the mixed pulp and fluid no longer having a whirling movement during transport to the other treatment station.

8. Apparatus for continuously distributing and mixing high consistency pulp with at least one treatment fluid comprising

an enclosed housing, said housing having a cylindrical portion thereof,

means for tangentially introducing pulp having a solids consistency of about 5% or more into said housing cylindrical portion,

means for imparting a rapid circular movement about an axis of rotation to said pulp, corresponding to a linear peripheral velocity at the velocity at which the pulp is fluidized, after introduction into said housing cylindrical portion, said moving pulp being initially contained by said housing cylindrical portion,

means for generally radially introducing a treatment fluid into the housing cylindrical portion in a predominantly even layer over a layer of moving pulp in said housing cylindrical portion, thus forming repeated layers of pulp and treatment fluid,

means for transforming the circular movement of said pulp having a layer of treatment fluid into a whirling movement translating along said axis of rotation of said pulp, so that displacement between the pulp layers takes place effecting complete mixing of said pulp and said treatment fluid, said transforming means comprising a generally converging open conical portion extending outwardly from one end of said cylindrical housing portion, said

conical housing portion having an outlet disposed at the termination of the convergence thereof, and

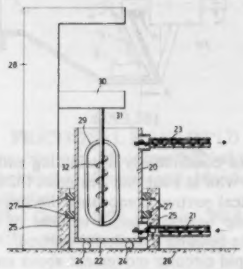
means for transporting the now mixed pulp and treatment fluid to another treatment station, the mixed pulp and fluid no longer having a whirling movement during transport to the other, treatment station.

4,093,507

METHOD OF LIQUID TREATING CELLULOSE FIBRES WITH ELASTIC PRESSURE SHOCKS

Torsten Gillberg, 39 Norralundsgatan, S-602 14 Norrkoping, Sweden

Filed Nov. 17, 1976, Ser. No. 742,919
Int. Cl.[2] D21C *1/02, 1/10, 5/02*
U.S. Cl. 162—18 **1 Claim**



1. In a method of treating cellulose fibers in a cellulose pulp wherein the pulp consistency is in the range of 10–90%, and wherein intermittent elastic compression forces are applied to the fibers, the improvement wherein the applying of elastic forces comprises the steps of:

positioning a rotatable paddle wheel eccentrically within a container so that paddle arms of the paddle wheel at least closely approach an interior wall portion of said container intermittently,

providing said wall portion with an elastic surface,

introducing the fibers into the container,

rotating the paddle wheel to intermittently elastically compress the fibers against said elastic surface to apply elastic pressure shocks to the fibers for a duration not exceeding one second and of a magnitude causing pressure in the interior of the fibers to exceed 0.2 atmospheres excess pressure, whereby liquid is expelled from the fibers and the fibers are not permanently deformed,

allowing the fibers to expand following the pressure shocks to adsorb liquid, and

repeating said steps of applying shocks and allowing the fibers to expand, until the fibers are completely impregnated with liquid.

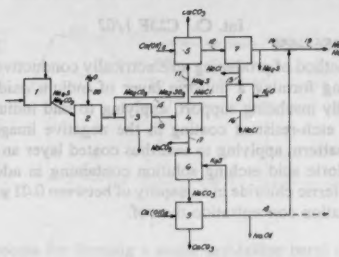
4,093,508

PROCESS FOR RECOVERING CHEMICALS FROM THE WASTE LIQUORS OF SULFATE CELLULOSE DIGESTION AND THE WASTE WATERS OF BLEACHING

Kaj Olof Henricson, Kauniainen, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Mar. 10, 1975, Ser. No. 556,974
Claims priority, application Finland, Mar. 12, 1974, 743/74
Int. Cl.[2] D21C *11/12*
U.S. Cl. 162—30 K **3 Claims**

1. In a process for the recovery of chemicals from the waste liquors of sulfate cellulose digestion and from the waste waters of bleaching, wherein the waste liquor from the digestion is concentrated by evaporation and the concentrated waste liquor is burned in a recovery boiler to produce a melt mainly containing sodium sulfide, sodium carbonate and sodium chloride, the melt is dissolved in the waste waters of bleaching and is clarified to produce green liquor containing sodium carbonate, sodium sulfide and sodium chloride and the carbonate and the chloride are separated from the green liquor, the improvement which consists of (1) separating sodium carbonate from the green liquor by crystallization under conditions to retain all the sodium chloride in the sodium sulfide-containing mother liquor said mother liquor being saturated with respect to sodium chloride, dissolving the crystallized sodium carbonate, caustizing at least a portion of the sodium carbonate solution



with a caustizing agent which is calcium hydroxide to form sodium hydroxide, (2) caustizing the sodium carbonate-depleted sodium sulfide containing mother liquor with calcium hydroxide, to convert residual sodium carbonate to sodium hydroxide (3) concentrating by evaporating said mother liquor to precipitate sodium chloride, (4) separating sodium chloride therefrom and combining the resultant mother liquor containing sodium sulfide with the sodium hydroxide-containing solution in a ratio suitable to form a digestion solution with a desired sulfide content.

4,093,509

PRODUCTION OF PULP SLURRIES EMPLOYING ISATOIC ANHYDRIDE

Richard L. Jacobs, Perrysburg, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jun. 27, 1977, Ser. No. 810,013
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 **1 Claim**

1. A method for making paper comprising adding to an aqueous pulp slurry, based upon the weight of the pulp in the slurry, from 1 to 5 percent of isatoic anhydride to shorten the beating time required to achieve a given degree of pulp freeness as compared to the beating time required to achieve the same degree of freeness for the pulp slurry without an isatoic anhydride addition, and forming the paper sheet, whereby the paper sheet has improved dry strength as compared to a paper formed from the pulp without an isatoic anhydride addition, and beaten to the same degree of freeness.

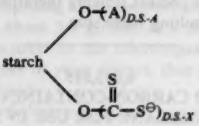
4,093,510

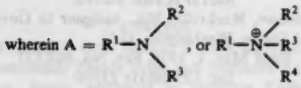
XANTHATED STARCH AMINE PAPER ADDITIVES

Merle E. Carr, Chillicothe, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 7, 1977, Ser. No. 785,616
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—175 **17 Claims**

1. Compositions for use in increasing the wet and dry strength of paper comprising xanthated starch amines (XSA) characterized by the following general structure:



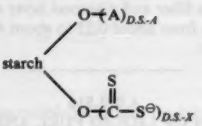


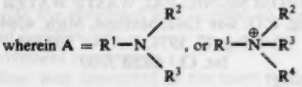
wherein R^1 is a C_1–C_6 alkylene or hydroxy-substituted alkylene; and R^2, R^3, and R^4 are each selected from the group consisting of hydrogen, C_1–C_{12} straight or branched alkyl, cyclohexyl, phenyl, and benzyl;

wherein D.S.-A represents the degree of substitution of the amine group; and

wherein D.S.-X represents the degree of substitution of the xanthate group.

8. A method of increasing the wet and dry strength of a paper product comprising adding to the pulp furnish as a wet-end additive in a papermaking process an effective amount of a xanthated starch amine (XSA) characterized by the following general structure:





wherein R^1 is a C_1–C_6 alkylene or hydroxy-substituted alkylene; and R^2, R^3, and R^4 are each selected from the group consisting of hydrogen, C_1–C_{12} straight or branched alkyl, cyclohexyl, phenyl, and benzyl;

wherein D.S.-A represents the degree of substitution of the amine group; and

wherein D.S.-X represents the degree of substitution of the xanthate group.

4,093,511

APPARATUS FOR OXYGEN BLEACHING OF PULP INCLUDING RECIRCULATION OF EXHAUST GASES

Johan Christoffer Fredrik Carl Richter, St. Jean Cap Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Division of Ser. No. 500,899, Aug. 26, 1974, Pat. No. 3,963,561. This application Feb. 9, 1976, Ser. No. 656,585

Claims priority, application Sweden, Aug. 27, 1973, 7311580

Int. Cl.[2] D21C *9/10, 7/00*

U.S. Cl. 162—234 **4 Claims**

1. Apparatus for oxygen bleaching of pulp comprising

an oxygen reactor vessel including an inner concentric sub-vessel having a larger diameter at the open top thereof than at the bottom thereof, and an outer chamber surrounding and completely enclosing said inner sub-vessel, said outer chamber having a pressurized gas-filled top portion thereof above the open top of said inner sub-vessel, and having a liquid level below the top of said inner sub-vessel,

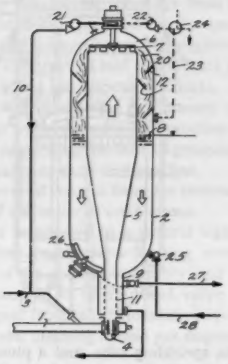
means for transporting high-consistency pulp to an inlet in the bottom of said sub-vessel,

means for adding oxygen to said pulp in said means for transporting said pulp before entry into said opening in the bottom of said sub-vessel,

means for emulsifying the pulp and the oxygen to thoroughly mix them together before entry of said pulp into the bottom inlet in said sub-vessel,

rotatable scraper means associated with said inner sub-vessel at the top thereof to distribute pulp over the top edge of said inner sub-vessel into said outer chamber,

an outlet for oxygen bleached pulp from said outer chamber, located adjacent the bottom of said outer chamber, and



means for exhausting gas from said top portion of said outer chamber and returning said exhausted gases to said means for adding oxygen to said pulp in said means for transporting said pulp before entry into said opening in the bottom of said sub-vessel.

4,093,512

PAPERMAKERS BELTS HAVING ULTRA-HIGH MODULUS LOAD BEARING YARNS

Thomas B. Fleischer, East Greenbush, N.Y., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Apr. 23, 1975, Ser. No. 571,031

Int. Cl.[2] D21F *1/10, 7/08*

U.S. Cl. 162—348 **16 Claims**

1. A papermakers' belt for use in a papermaking machine and comprised of ultra-high modulus load-bearing yarns comprised of poly (para-phenylene terephthalamide).

4,093,513

WATER MODERATED REACTOR

Tadeusz Berens, and Ragnar Mansson, both of Vasteras, Sweden, assignors to Aktiebolaget Asea-Atom, Vasteras, Sweden

Filed Aug. 25, 1975, Ser. No. 607,612

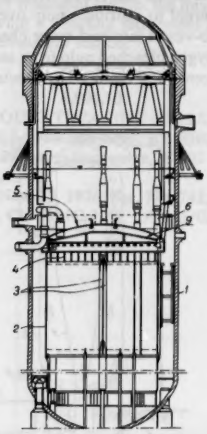
Claims priority, application Sweden, Aug. 29, 1974, 7410932

Int. Cl.[2] G21C *15/00*

U.S. Cl. 176—37 **2 Claims**

1. Water moderated reactor comprising a reactor pressure vessel with a plurality of vertically arranged fuel assemblies which are enclosed in a moderator tank provided with a cover and positioned by means of an upper core grid arranged in the moderator tank, and comprising a sprinkling device arranged above said core grid and below said cover, said sprinkling device comprising a plurality of substantially linear and horizontal main sprinkling tubes individually provided with a plurality of sprinkling nozzles, a common distributing pipe for

sprinkling water connected to said main sprinkling tubes, a plurality of auxiliary tubes each positioned above a corresponding main sprinkling tube, and a plurality of transverse metal tubes hydraulically and mechanically connecting said auxiliary tubes to corresponding main sprinkling tubes.



4,093,514

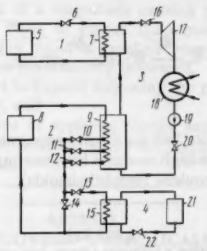
METHOD OF BRINGING NUCLEAR POWER PLANT TO FRACTIONAL ELECTRICAL LOAD CONDITIONS

Vladimir Grigorievich Iljunin, ulitsa Migunova, 9, kv. 28; Igor Alexeevich Kuznetsov, ulitsa Solnechnaya, 5, kv. 2; Viktor Mikhailovich Murogov, prospekt Lenina, 13/1, kv. 4, all of Obninsk, Kaluzhskoi oblasti, and Anatoly Nikolaevich Shmelev, Novorogozhskaya ulitsa, 4, kv. 7, Moscow, all of U.S.S.R.

Continuation of Ser. No. 586,802, Jun. 13, 1975, abandoned, which is a continuation of Ser. No. 406,215, Oct. 15, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,773

Int. Cl.[2] G21C *15/16*

U.S. Cl. 176—65 **4 Claims**



1. A method of bringing a nuclear power plant to fractional electric load conditions, which nuclear power plant comprises a turbine driven by a working substance, at least two nuclear reactors, at least one nuclear reactor being a breeder and both reactors transferring heat to said working substance, said method comprising the steps of: reducing the supply of working substance to said turbine in accordance with a predetermined fractional load; transferring heat successively from said nuclear reactors to said working substance; connecting said breeding reactor to a first cooling circuit having a first coolant temperature; connecting the other nuclear reactor to a second cooling circuit with a coolant temperature higher than said first coolant temperature; lowering the coolant temperature at the inlet and outlet of said breeding reactor to a level corresponding to the reduced supply of said and increasing the power of said breeding reactor as a result of the lowering of the temperature of the coolant flowing therethrough; and removing excess heat resulting therefrom.

4,093,515

LAMINATED CARBON-CONTAINING SILICONE RUBBER MEMBRANE FOR USE IN MEMBRANE ARTIFICIAL LUNG

Theodor Kolobow, Rockville, Md., assignor to Government of the United States, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 663,127

Int. Cl.[2] B01D *13/00*

U.S. Cl. 195—1.8 **19 Claims**

1. In a membrane artificial lung device for extracorporeal blood gas exchange during blood perfusion therethrough including a blood-compatible gas-permeable membrane through which said exchange is effected, the improvement consisting of said membrane being a laminated silicone rubber membrane composed of at least two layers comprising a first layer of silicone rubber compounded with from about 25 to about 40% by weight of silica filler and a second layer of silicone rubber compounded with from about 0.25 to about 40% by weight of carbon black filler.

4,093,516

PREPARATION OF LIQUID FUEL AND NUTRIENTS FROM MUNICIPAL WASTE WATER

John L. Lang, P.O. Box 1242, Midland, Mich. 48640

Filed Sep. 27, 1974, Ser. No. 509,813

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—27 **9 Claims**

1. The process for preparation of useful substances, including liquid fuel stock and nutrient materials from liquidous municipal waste which comprises essentially the steps of:

(a) adjustment of the solids content of said liquidous waste;

(b) hydrolysis and saccharification of the polysaccharides and other components of said liquidous waste in the presence of an essentially constant concentration of a hydrolytic agent selected from the group consisting of oxygen, ozone, and acidic compounds of sulfur and phosphorus, and carried out to the extent that the organic portion of the liquidous waste is essentially solubilized and sterilized;

(c) rendering innocuous the hydrolytic agent of step (b);

(d) adjustment of the soluble solids content and the pH of the so-obtained mixture to provide a suitable environment for fermentation of said mixture;

(e) innoculation of said sterile mixture with a selected essentially single fermentation species, and, when desired, with enzymatic materials;

(f) fermentation of said mixture under conditions suitable for metabolic action by said fermentation species; and

(g) isolation of the desired product components from the fermented mixture.

4,093,517

METHOD FOR PRODUCING CHOLESTEROL OXIDASE IN THE PRESENCE OF A NONIONIC SURFACTANT

Prakash S. Masurekar, Webster, and Charles T. Goodhue, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 639,690, Dec. 11, 1975. This application Nov. 15, 1976, Ser. No. 741,908

Int. Cl.[2] C12D *13/10*

U.S. Cl. 195—66 R **10 Claims**

1. A method for producing cholesterol oxidase comprising:

growing a cholesterol oxidase-producing microorganism in a medium comprising a cholesterol oxidase inducer, from about 1.0 to about 5.0 g./liter of a nonionic surfactant which is non-toxic to the microorganism, and at least about 10 g./liter of yeast extract, thus producing cholesterol oxidase; and

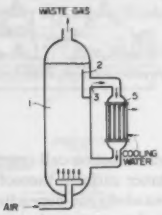
recovering the cholesterol oxidase.

4,093,518

STIRRED GAS BUBBLE FERMENTER

Michito Hamanaka; Toshio Sano, and Noriharu Kumura, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jan. 25, 1977, Ser. No. 762,422
Claims priority, application Japan, Feb. 4, 1976, 51-10413
Int. Cl.[2] C12B *1/12, 1/18*
U.S. Cl. 195—142 **19 Claims**



1. In a stirred gas bubble fermenter having aeration means, a waste gas outlet and an overflow exit, and provided with a cooler outside the fermenter and coupled to the fermenter through said overflow exit,

the improvement comprising:

an overflow weir connected to the inner wall of the fermenter below said overflow exit and extending at least in the upward direction of the fermenter so as to be opposite at least a portion of said overflow exit; and

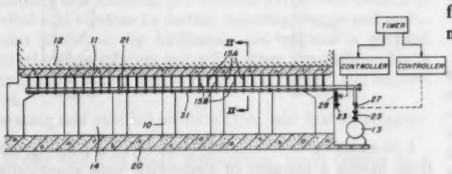
a guide plate arranged between at least a portion of said overflow weir and at least a portion of said overflow exit to improve gas-liquid separation.

4,093,519

DECARBONIZING APPARATUS FOR AN UNDERJET-TYPE OF COKE OVEN BATTERY

Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 7, 1975, Ser. No. 602,766
Claims priority, application Germany, Aug. 19, 1974, 2439724
Int. Cl.[2] C10B *43/12, 21/12*
U.S. Cl. 202—241 **7 Claims**



1. In a battery of underjet coke ovens which includes regenerative heating by regenerators above a cellar, gas distribution pipes in the cellar including rich gas feed pipes extending from each distribution pipe through regenerators having a high temperature environment to conduct rich gas to burners within a row of heating flues between two coking chambers, a gas dispensing nozzle located within the relatively cool part of the pipes in the cellar below the regenerators for supplying rich gas to each burner, the improvement in a decarbonizing apparatus including:

a pipeline in said cellar for conducting compressed air below each row of heating flues, each pipeline extending in a generally parallel relation to a gas distribution pipe supplying rich gas to said nozzles,

means below the high temperature environment of said regenerators coupled between each gas dispensing nozzle for rich gas to inject compressed air from said pipeline into the gas distribution pipe toward the opening in a gas dispensing nozzle located below the regenerators within said relatively cool part of said distribution pipe for periodic cleaning of the gas dispensing nozzle,

a supply header for conducting compressed air along the battery of coke ovens for each said pipeline,

valve means for controlling the flow of compressed air from said supply header to each said pipeline,

a regenerative reversal control timer for reversing regenerative heating of the underjet coke ovens,

controller means responsive to a control signal from said timer to control regenerative heating reversals in the heating walls of the coke oven battery, and

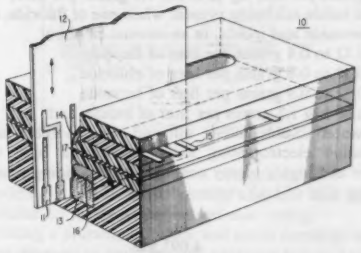
control means coupled to operate said valve means in response to a signal from said regenerative reversal control timer for periodic cleaning of said gas dispensing nozzles.

4,093,520

PROCESS FOR GOLD PLATING

Donald Eldridge Koontz, and Uziel Landau, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 658,702, Feb. 17, 1976, abandoned.
This application Jul. 20, 1977, Ser. No. 817,267
Int. Cl.[2] C25D *5/02, 5/08, 5/16*
U.S. Cl. 204—15 **5 Claims**



1. A process for electroplating metals and alloys selected from the group consisting of soft gold, hard gold, nickel, tin-nickel, and tin-lead on surfaces comprising the step of:

passing current from an electrical energy source through an anode, plating solution and cathode with surfaces to be plated as part of the cathode in which electrical resistors are located outside the plating solution and in series between the electrical energy source and the surfaces to be plated and in which plating solution is pumped through a plating cell so that plating solution flows parallel to the surface to be plated with a given parallel flow rate characterized in that

(a) the electrical resistance is between 10 and 10,000 ohms;

(b) the flow rate of the plating solution parallel to the surface being plated is between 10 cm/sec and 800 cm/sec; and

(c) the current density is between 50–300 ma/cm^2 for hard gold, so as to produce uniform, predetermined plating thickness.

4,093,521

CHROMIUM ELECTROPLATING

Stanley Renton, 6 Kenilworth Close, Penkridge, Staffordshire, and John Cooper Crowther, 14 Gilbanks Road, Stourbridge, West Midlands, both of England

Continuation-in-part of Ser. No. 751,376, Dec. 17, 1976, abandoned. This application Jun. 28, 1977, Ser. No. 810,744
Claims priority, application United Kingdom, Dec. 18, 1975, 51798/75; Feb. 26, 1976, 07595/76
Int. Cl.[2] C25D *3/06, 3/56*
U.S. Cl. 204—43 R 7 Claims

1. In a trivalent chromium electroplating bath of the type which consists essentially of an acidic aqueous solution of trivalent chromium, a carboxylate selected from formate, acetate and mixtures thereof, a bromide and ammonium the improvement which consists in maintaining in said bath an amount of metal ion selected from (i) iron or nickel in the amount of between 30 and 150 parts per million of the solution by weight, or (ii) iron plus nickel in the amount of between 30 and 150 ppm with the nickel being in an amount up to about 100 ppm.

4,093,522

ELECTROLYTIC CHROMIC ACID BATH FOR CHROME PLATING

Horst Dillenberg, Kaiser-Wilhelm-Allee 26, 56 Wuppertal 1, Germany

Filed Dec. 17, 1975, Ser. No. 641,607
Claims priority, application Germany, Jan. 10, 1975, 2500730
Int. Cl.[2] C25D *3/10*
U.S. Cl. 204—51 3 Claims

1. An electrolytic chromic acid bath for chromium plating consisting essentially of:

chromic acid in an amount of about 110 grams up to about 450 grams per liter;

a water soluble pyridinium, quinolinium or acridinium halide salt;

a water soluble pyridinium, quinolinium or acridinium sulfate salt;

said sulfate salt being present in an amount of at least 1.1 grams per liter up to about 7.0 grams per liter;

said halide salt being present when one of fluoride, chloride, bromide and iodide, in an amount of about

0.12 to 0.4 grams per liter of fluoride

0.18 to 0.6 grams per liter of chloride

0.32 to 0.9 grams per liter of bromide

0.40 l to 1.2 grams per liter of iodide; and

said water soluble sulfate salt and water soluble halide salt regulating electroplating and providing a high throwing power and highly glossy coating while avoiding scorching at coating sites of high current density.

4,093,523

BRIGHT ACID ZINC ELECTROPLATING BATHS

John A. Henricks, Oak Park, and Robert E. Wild, Wheaton, both of Ill., assignors to Edward B. Wild, Wheaton, Ill.

Filed Feb. 7, 1977, Ser. No. 766,554
Int. Cl.[2] C25D *3/22*
U.S. Cl. 204—55 R 8 Claims

1. The method of electroplating a bright zinc deposit from an aqueous acid chloride electrolyte containing potassium chloride as the conducting salt and boric acid as the buffer; by means of an aromatic aldehyde or ketone brightener that is dispersed into the electrolyte by means of a mixture of, 1- a fatty imidazole sulfonate, 2- a fatty amido betaine and 3- a hydrotropic coupling agent selected from the group consiting of cyclic alcohols, glycol ethers and aromatic sulfonates that are not wetting agents.

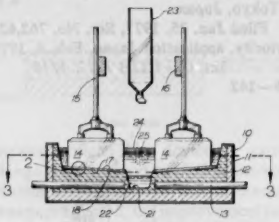
4. A mixture of addition agents that will produce a bright zinc deposit of an aqueous acid zinc chloride bath; said mixture consisting essentially of an aromatic aldehyde or ketone that is held in solution by means of a fatty imidazole sulfonate, a fatty amido betaine and a hydrotrope selected from the group consisting of cyclic alcohols, glycol ethers, and aromatic sulfonates that are not wetting agents.

4,093,524

BONDING OF REFRACTORY HARD METAL

John R. Payne, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 749,563, Dec. 10, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,061
Int. Cl.[2] C25B *1/00*; C25C *3/06, 3/08, 7/02*
U.S. Cl. 204—61 19 Claims



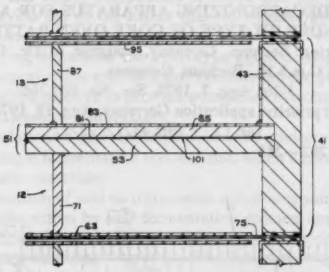
1. In an aluminum reduction cell comprising a shell defining a cavity with the inner surfaces thereof lined with refractory material, at least one electrode depending into the cavity, and a second electrode of opposite polarity to the first mentioned electrode wherein the surface of at least one of the electrodes is protected by refractory hard metal, the improvement comprising an aluminum carbide bond at the interface between the refractory hard metal and the protected electrode surface which is formed in situ at the interface thereof by reacting a carbonaceous material with molten aluminum.

4,093,525

METHOD OF PREVENTING HYDROGEN DETERIORATION IN A BIPOLAR ELECTROLYZER

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 20, 1976, Ser. No. 716,311
Int. Cl.[2] C25B *1/16, 1/26, 9/02*
U.S. Cl. 204—98 2 Claims



1. In a method of conducting electrolysis in a bipolar electrolyzer having a plurality of electrolytic cells electrically and mechanically in series comprising passing an electrical current from an anodic end of said electrolyzer to anodes of a first electrolytic cell through an aqueous alkali metal chloride anolyte and an aqueous alkali metal hydroxide containing catholyte to cathodes of said first electrolytic cell, evolving hydrogen at said cathodes, and passing said electrical current from said cathodes through a bipolar unit to which said cathodes are joined to anodes of a subsequent cell in said electrolyzer, said anodes joined to the opposite side of said bipolar unit, and

thereafter to a cathodic end of said electrolyzer, the improvement comprising:

passing said electrical current from the cathodes of the first cell laterally to the overall vector flow of current through the electrolyzer, from an anodic end of said electrolyzer to a cathodic end of said electrolyzer, to conductor means at the periphery of said cell; and

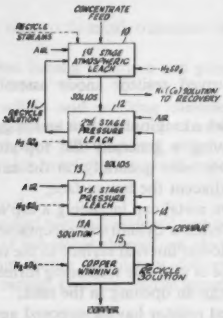
passing said electrical current through said conductor means parallel to the vector flow of current through the electrolyzer and then in a direction laterally to the vector flow of current through the electrolyzer from the conductor means to the anodes of the subsequent cell.

4,093,526

HYDROMETALLURGICAL LEACHING AND REFINING OF NICKEL-COPPER CONCENTRATES, AND ELECTROWINNING OF COPPER

Jorge L. Blanco, New Orleans; Ranko P. Crnojevich, Gretna, both of La., and Courtney S. Simons, Weston, Conn., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 8, 1977, Ser. No. 831,364
Int. Cl.[2] C25B *1/22*; C25C *1/12*
U.S. Cl. 204—104 **32 Claims**



1. A process for the hydrometallurgical refining of a sulfur-containing nickel-copper concentrate in which at least about 20% by weight of the total nickel present is in an acid-soluble metallic form which comprises:

providing a slurry of said concentrate in particulate form in a copper-containing sulfuric acid leaching solution having a pH ranging up to about 3.5,

subjecting said slurry to a first stage leaching and refining step at atmospheric pressure and a temperature ranging from about 40° to 95° C while simultaneously aerating said slurry to effect the simultaneous dissolution of nickel and cementation of substantial amounts of copper from said solution,

continuing said leaching to a terminal pH of over about 5 to refine said solution by further rejecting copper and impurities therefrom by hydrolysis and provide a purified nickel sulfate solution and a first stage atmospheric leach residue containing undissolved nickel, copper and impurities,

separating said purified solution from said first stage atmospheric leach residue for nickel recovery,

subjecting said first stage atmospheric leach residue as a slurry to a second stage oxidation leaching step at elevated temperature and pressure in a copper-containing sulfuric acid solution for a time sufficient to reach a terminal pH ranging from about 2.5 to 4 and to effect dissolution of substantial amounts of nickel and some copper and provide a second stage pregnant solution thereof and a second stage residue impoverished in said nickel,

the copper-containing sulfuric acid solution employed in said second stage leaching step having a composition such that the total molar ratio of free H_2SO_4 plus Cu-SO_4 to the nickel in said atmospheric leach residue ranges from about 0.7:1 to 1.3:1,

separating the second stage pregnant solution containing nickel and copper from said second stage leach residue,

recycling said second stage pregnant solution to said first stage atmospheric leach for separating the nickel from dissolved copper and impurities in said solution,

subjecting said second stage leach residue to a third stage oxidation leaching step at elevated temperature and pressure in a sulfuric acid-containing solution with the total sulfur to the total nickel + copper ratio on the molar basis ranging from about 0.9:1 to 1.3:1 to effect dissolution of substantially all of the nickel and copper in said residue,

thereby forming a third stage leach residue and a third stage pregnant nickel-copper sulfate solution containing a major amount of copper, and having a terminal pH ranging up to about 3,

subjecting said third stage pregnant solution to a copper winning step for the selective removal of copper while regenerating acid therein and thereby provide a spent copper-sulfuric acid solution,

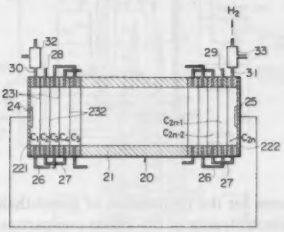
and recycling said spent acid solution back into the process to recover the remaining non-ferrous metal values therefrom.

4,093,527

HYDROGEN GENERATING APPARATUS

Kazuo Tanno, Hitachi; Yasumasa Furutani, Katsuta; Takashi Honda, Hitachi, and Akira Uenishi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,362
Claims priority, application Japan, Dec. 13, 1974, 49-142535
Int. Cl.[2] C25B *1/02*; B01D *13/02*
U.S. Cl. 204—129 **13 Claims**



1. A hydrogen generating method, comprising:

(1) providing a cell having a casing, and first and second electrodes on the opposite ends of said casing;

(2) providing a plurality of cation and anion exchange membranes disposed in said casing in a manner that said cation and anion exchange membranes are alternately arranged between said electrodes and are spaced from each other to define a plurality of chambers, with each chamber constituting the space encompassed by a cation exchange membrane, an adjacent anion exchange membrane and said casing, and electrically isolating with said casing and membranes each chamber from the adjacent chambers and transferring only cations and anions from one chamber to an adjacent chamber through the respective membranes;

(3) introducing a first aqueous electrolyte into every other one of said chambers;

(4) introducing a second aqueous electrolyte of the same kind as said first electrolyte into said other chambers, while maintaining the second electrolyte at a concentration lower than that of the first electrolyte;

(5) heating part of the first electrolyte outside of said chambers to concentrate the first electrolyte by vaporizing water therein and removing the vaporized water from the first electrolyte;

(6) introducing water into said other chambers containing

the second electrolyte to dilute the second electrolyte so as to maintain a predetermined concentration difference between the first and second electrolytes; and

(7) maintaining the number of said chambers at least enough so that the sum of the theoretical decomposition voltage of water to be generated across said electrodes, a voltage drop due to the hydrogen over-voltage determined by the material of said electrodes and a voltage drop due to the interior resistance of the cell is high enough to decompose the water in the electrolyte to generate hydrogen at one of said electrodes when said electrodes are electrically interconnected in an electrical path electrically parallel to the chambers.

4,093,528

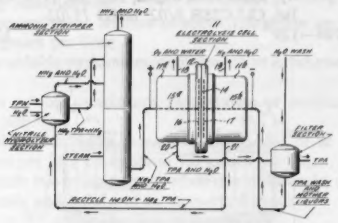
TEREPHTHALIC ACID PROCESS

Raymond Wynkoop, Media, Pa.; Oscar L. Norman, and Richard V. Norton, both of Wilmington, Del., assignors to Suntech, Inc., Wayne, Pa.

Filed Mar. 10, 1977, Ser. No. 776,453

Int. Cl.[2] C25B *3/00*; C07C *51/08, 63/26, 63/28*

U.S. Cl. 204—180 P **9 Claims**



1. A process for the preparation of terephthalic acid which comprises electrolyzing in the anode compartment of an electrolysis cell wherein said anode compartment is separated from the cathode compartment by a cation selective membrane, an aqueous solution of sodium terephthalate at a molar concentration of from about 0.1 to about 0.7 to form an aqueous suspension of terephthalic acid and separating said terephthalic acid product, said electrolysis being conducted at a temperature of from about 60° to about 120° C, a current density of from about 100 to about 500 amps per square foot, and at a voltage of from about 5 to about 12 volts.

6. A process for the preparation of terephthalic acid which comprises hydrolyzing terephthalonitrile in an aqueous medium containing a stoichiometric excess of sodium hydroxide at a temperature of between about 100° and about 250° C, removing ammonia generated by the hydrolysis from the aqueous medium, subjecting an aqueous solution containing from about 0.1 to about 0.7 molar per liter of sodium terephthalate obtained by said hydrolysis to electrolysis in the anode compartment of an electrolysis cell wherein said anode compartment is separated from the cathode compartment by a cation selective membrane to form an aqueous suspension of terephthalic acid and separating said terephthalic acid product, said electrolysis being conducted at a temperature of from about 60° to about 120° C, a current density of from about 100 to about 500 amps per square foot, and at a voltage of from about 5 to about 12 volts.

4,093,529

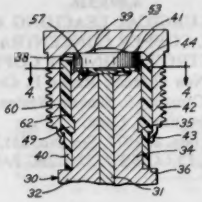
RESISTOR ANODE FOR METAL TANK

Carl G. Strobach, Clarendon Hills, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

Continuation-in-part of Ser. No. 704,343, Jul. 12, 1976, abandoned, which is a continuation of Ser. No. 542,459, Jan. 20, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,517

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 **4 Claims**



1. An improved resistor anode assembly comprising, in combination:

an anode with a longitudinal axis and of generally cylindrical shape having a generally flat top surface, an exposed, center core wire generally on the axis, and including a groove adjacent the top surface;

a conductive metal cap including a top and cylindrical side wall to define a cylindrical receptacle for receipt of the anode, a lower internal surface in the receptacle, an external surface of said side wall being formed for attaching the cap through an opening in the tank;

a disc-shaped resistor having opposed generally flat contact surfaces, said resistor being interposed between the internal surface of the cap and the exposed end of the core wire, one of said disc contact surfaces being in mechanical and electrical contact with the internal surface of the cap;

a conductive biasing spring having an anode end and a resistor end, the spring having an axial passage with the anode end positioned at one end of the passage along the axis thereof whereby the anode end is accessible to a welding probe projecting in the passage, said anode end being in mechanical and electrical contact by welding to the core wire and the resistor end being generally flat to provide mechanical and electrical friction contact with the other contract surface of said disc; and

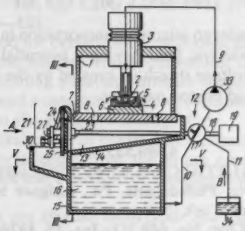
an elastic deformable, hollow, insulating sleeve positioned in said receptacle between the cap side wall and said anode, said sleeve being generally cylindrical and including means cooperating with the anode groove on the inside to facilitate holding the anode, the diameter of the anode being less than the cap receptacle, said anode also projecting into said receptacle, said cap being force fitted and swaged onto said sleeve to retain the anode, said sleeve also separating the resistor, and conductive biasing spring from the cylindrical side wall of the cap, whereby said resistor and spring provide a sole conductive, series path for electrical flow between the anode core wire and the lower internal surface of the cap and maintain said sole path by prevention of electrical contact between the conductive biasing spring or the edge of said disc and said cap regardless of dimensional changes in said anode assembly and by accommodation of any dimensional changes due to expansion or compression of the assembly.

4,093,530

DEVICE FOR ELECTROCHEMICAL TREATMENT OF WORKPIECES

Vladimir Isaakovich Suslin, ulitsa Frunze, 17, kv. 46; Alexandr Ivanovich Dubovik, ulitsa Gvardeitsev Shironintsev, 63 A, kv. 22; Boris Anatolievich Makeev, ulitsa Novgorodskaya, 6, kv. 29; Pavel Semenovich Razdymakha, ulitsa Bljukhera, 26, kv. 121, and Zinovy Abramovich Lekarev, ulitsa Trinklera, 20, kv. 71, all of Kharkov, U.S.S.R.

Filed May 20, 1977, Ser. No. 799,119
Int. Cl.[2] B23P *1/02*; C25B *15/08*
U.S. Cl. 204—224 M 1 Claim



1. A device for electrochemical treatment of workpieces comprising:

a working chamber having a bottom and passages made in said bottom;

a tool disposed within said working chamber, a negative potential being applied to said tool in the course of treatment of a workpiece also disposed within said working chamber, to which workpiece a positive potential is applied;

a drive for said tool;

a working gap formed between said tool and said workpiece in the course of treatment thereof, an electrolyte and a washing medium being alternately delivered into said clearance and carried away therefrom separately through said passages;

an intermediate chamber with walls, said intermediate chamber being disposed directly under said working chamber and receiving said electrolyte and said washing medium alternately coming therein through said passages;

a feed tank for said electrolyte delivered into said working gap for treatment of said workpiece and discharged into the same feed tank from said intermediate chamber after said workpiece is treated;

a separate conduit for said electrolyte, communicating with said feed tank;

a water main for said washing delivered into said working gap for washing said workpiece and discharged into a drain from said intermediate chamber;

a separate conduit for said washing medium, communicating with said main and connected to said separate conduit for said electrolyte;

a common conduit for said electrolyte and said washing medium joining said separate conduits downstream of their junction and alternately delivering said electrolyte and said washing medium into said working gap;

a change-over means for actuating the delivery to said workpiece of said electrolyte or said washing medium and the discharge thereof, after the workpiece is treated, through said intermediate chamber, said change-over means consisting of a distribution valve located in said separate conduits, a control element operatively connected with said distribution valve so that said distribution valve alternately shuts off said conduit for the electrolyte or said conduit for the washing medium, a mechanism for separating the discharge of said electrolyte from that of said washing medium, disposed at said intermediate chamber and operatively connected through said distribution valve with said control element so that said mechanism carries out the discharge of the electrolyte or the washing medium according to their respective delivery through the distribution valve;

a pump for the delivery into said working clearance of said electrolyte from said electrolyte feed tank and said washing medium for said water main, or said electrolyte only;

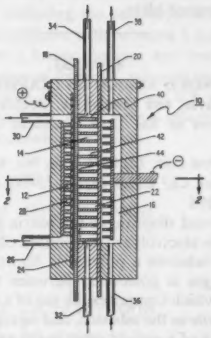
at least one pair of ports for the respective discharge of said electrolyte and said washing medium, made in one of the walls of said intermediate chamber; flaps provided in said mechanism for separating the discharge of said electrolyte from that of said washing medium, the number of said flaps corresponding to the number of said ports; an axle on which said flaps are hinged; a rod in said mechanism for separating the discharge of said electrolyte from that of said washing medium, having a first end and a second end, said first end being connected through said distribution valve with said control element; and a cam mounted on said second end of said rod and alternately interacting with each of said flaps in accordance with the operative position of said distribution valve.

4,093,531

APPARATUS FOR CONCENTRATION AND PURIFICATION OF A CELL LIQUOR IN AN ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, and Leo L. Benezra, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 644,977, Dec. 29, 1975, Pat. No. 4,036,717.
This application Apr. 18, 1977, Ser. No. 788,250
Int. Cl.[2] C25B *9/00, 13/08, 5/00*
U.S. Cl. 204—265 6 Claims



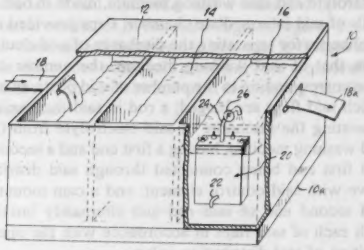
1. An electrolytic cell for the concentration and purification of a cell liquor comprising: a three compartment container; a porous catalytic anode disposed within an anode compartment of said container; a porous diaphragm separating the anode compartment and a central compartment; an essentially hydraulically impermeable cation-exchange membrane separating the central compartment and a cathode compartment; a cathode disposed within the cathode compartment; means for passing a cell liquor into the central compartment; means for passing hydrogen gas into the anode compartment and across said porous catalytic anode; means for passing an electrolyzing current between said anode and said cathode; means for recovering the purified and concentrated alkali metal hydroxide from the cathode compartment; means for recirculating hydrogen gas emanating from the cathode compartment and the anode compartment back into the anode compartment and across said porous catalytic anode; and means for stratifying the cell liquor within the central compartment.

4,093,532

RECOVERY OF SILVER FROM PHOTOGRAPHIC FILM

Nick G. Branibar, Sparta, N.J., assignor to Anken Industries, Morristown, N.J.

Filed Jan. 21, 1977, Ser. No. 761,376
Int. Cl.[2] C25C 1/20, 7/00, 7/02
U.S. Cl. 204—271 5 Claims



1. Apparatus for the electrodeposition of silver from solution comprising a housing having a removable cover and walls with grooves therein, anode-cathode plates within said housing and positioned with edge portions thereof within said grooved walls, said anode-cathode plates being maintained in spaced relation from one another, said removable cover including electrical contacts on the underside thereof in electrical contact-making engagement with said anode-cathode plates, said housing including a fluid inlet and outlet and a bottom compartment for receiving fluid under pressure from said fluid inlet and closed by a perforated plate at its top portion, the combined area of said perforations being less than the area of said fluid inlet, and support means of resilient material positioned on the upper surface of said perforated plate for supporting the lower edges of said anode-cathode plates in spaced relation from said perforated plate.

4,093,533

BONDED ASBESTOS DIAPHRAGMS

Richard N. Beaver, and Charles W. Becker, both of Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1975, Ser. No. 640,119
Int. Cl.[2] C25B 13/02, 13/06, 13/08
U.S. Cl. 204—296 6 Claims

1. An improved diaphragm for use in an electrolytic cell wherein brine is electrolyzed to produce chlorine, caustic, and hydrogen and wherein a polymeric fluorocarbon-bonded asbestos diaphragm is positioned between the electrodes, the improvement which comprises the use of a mixture of crocidolite and chrysotile as the asbestos, said mixtures of crocidolite/chrysotile being of a weight ratio in the range of about 33/67 to about 75/25.

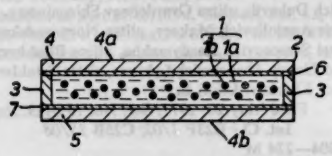
4,093,534

WORKING FLUIDS FOR ELECTROPHORETIC IMAGE DISPLAY DEVICES

Christopher Frederick Carter, Wooton; Roy Trevor Blunt, Towcester; James Cyril Alexander Lewis, and Geoffrey Michael Garner, both of Northampton, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Feb. 5, 1975, Ser. No. 547,338
Claims priority, application United Kingdom, Feb. 12, 1974, 06276/74; Jul. 19, 1974, 32047/74
Int. Cl.[2] C25D 1/12; B03C 5/00
U.S. Cl. 350—355 16 Claims

1. A working fluid for an electrophoretic image display comprising a dispersion of a species of finely divided particles of an opaque dielectric material suspended in a suspension medium, each of said particles having a chemical compound adsorbed onto the surface thereof and forming a coating thereon such that repulsive forces between the particles are modified by short range attractive interactions of functional groups possessed by the chemical compound, and wherein said



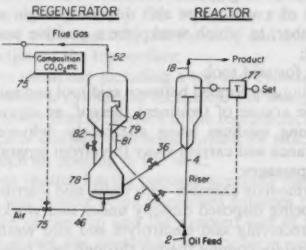
coated particles undergo selected transportation in dependence upon an applied electric field having a potential equal to or greater than the voltage threshold created by the dipole interaction between said coated particles.

4,093,535

CATALYTIC CRACKING PROCESS

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 649,261, Jan. 15, 1976, Pat. No. 4,072,600, and a continuation-in-part of Ser. No. 599,920, Jul. 28, 1975, and Ser. No. 440,890, Feb. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 399,008, Sep. 20, 1973, abandoned. This application Jun. 15, 1977, Ser. No. 806,713
Int. Cl.[2] C10G 11/04; B01J 8/24; C01B 29/12
U.S. Cl. 208—120 9 Claims



1. In a process for the catalytic cracking of gas oil to produce products boiling in the motor fuel range, wherein said gas oil is contacted with a porous acidic solid catalyst in a cracking vessel at conversion conditions including elevated temperatures and the absence of added hydrogen so as to convert said gas oil to lower molecular weight products with deposit on said catalyst of a deactivating solid carbonaceous contaminant resulting from said cracking, the so deactivated catalyst being transferred to a regeneration vessel in which oxidation of said carbonaceous deposit proceeds in the presence of air with generation of carbon monoxide and carbon dioxide and the regenerated catalyst at elevated temperature is transferred from said regeneration vessel to said cracking vessel to catalyze further cracking and supply at least part of the heat of reaction required by said cracking, the improvement which comprises:

conducting said cracking and said regeneration with an inventory of solid, porous, acidic cracking catalyst particles of which at least a portion contains an oxidation catalyst comprising at least one metal selected from the group consisting of platinum, palladium, iridium, osmium, rhodium, ruthenium, and rhenium such that said metal is capable of contacting said gas oil but limiting the concentration of said metal to an amount great enough to promote oxidation of CO and inadequate to substantially increase the generation of coke and hydrogen in said reaction vessel as compared with a like catalyst free of

such metal, said amount being less than 50 ppm based on total catalyst inventory.

4,093,536

CATALYTIC CRACKING AND DEHYDROCYCLIZING OF ALKANES USING ALKALINE EARTH OXIDES PROMOTED WITH MANGANESE OXIDE AND/OR RHENIUM OXIDE

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 460,935, Apr. 15, 1974, abandoned. This application May 22, 1975, Ser. No. 580,010
Int. Cl.[2] C10G *11/04*; B01J *27/04*
U.S. Cl. 208—121 11 Claims

1. A method for catalytically converting alkanes comprising contacting the alkanes under converting conditions with a catalyst by forming a reaction mixture consisting essentially of said alkanes and a catalyst consisting essentially of components selected from the group consisting of:

(A) two alkaline earth oxides and a promoting amount of a promoter selected from the group consisting of manganese oxide and a mixture of manganese oxide and rhenium oxide,

(B) at least one alkaline earth oxide and a promoting amount of rhenium oxide, and

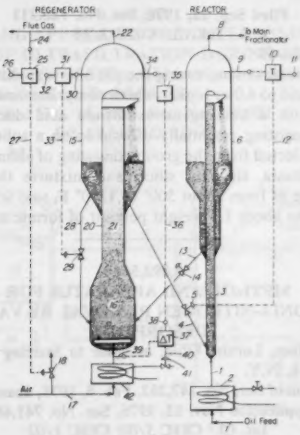
(C) an alkaline earth oxide selected from the group consisting of strontium and barium and a promoting amount of a promoter selected from the group consisting of manganese oxide and a mixture of manganese oxide and rhenium oxide.

4,093,537

FCC CATALYST SECTION CONTROL

Benjamin Gross, and Wooyoung Lee, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 608,351, Aug. 27, 1975, abandoned, and Ser. No. 608,352, Aug. 27, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,639
Int. Cl.[2] C10G *13/18*
U.S. Cl. 208—164 9 Claims



1. In a fluid catalytic cracking process for cracking a hydrocarbon feed stream, wherein said stream is contacted with hot regenerated catalyst in a reactor section maintained under catalytic cracking conditions to form cracked products and spent catalyst contaminated by coke; and wherein said cracked products and spent catalyst are separated in, and recovered from, said reactor section; and wherein said recovered spent catalyst is continuously circulated through a regenerator section operating in the complete CO-burning mode thereby burning said contaminating coke by contact with air and forming hot regenerated catalyst and flue gas at substantially the same temperature, said hot regenerated catalyst having a temperature substantially higher than said spent catalyst, said regenerator section being provided with adjustable means for recycling a portion of hot regenerated catalyst to said recovered spent catalyst; and also with adjustable means for preheating said air; and wherein hot regenerated catalyst is recirculated to said reactor section, the method for controlling the process, whereby improving its adaptive behavior, which comprises:

comparing the temperature of the hot regenerated catalyst with a predetermined temperature to obtain a regenerated catalyst temperature deviation; and,

adjusting within the regenerator section, the recycle of hot regenerated catalyst to spent catalyst to change the recycle ratio in a direction to reduce said temperature deviation, said recycle ratio being in the range of at least about 0.7 to about 5 before and after said change; and

adjusting the air preheat temperature in a direction to reduce said regenerated catalyst temperature deviation.

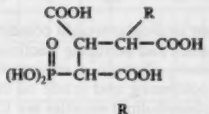
4,093,538

PROCESS FOR INHIBITING THE CORROSION OF HEAVY PULPS FOR HEAVY MEDIA SEPARATION OF MINERALS

Joachim Kandler, Erftstadt Lechenich; Klaus Komorniczyk, Kerpen, and Mathias Reitz, Cologne, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 22, 1975, Ser. No. 607,013
Claims priority, application Germany, Aug. 28, 1974, 2441096
Int. Cl.[2] B03B *5/30*
U.S. Cl. 209—172.5 1 Claim

1. A process for inhibiting the corrosion of aqueous heavy pulps containing ferrosilicon with between 8 and 20 weight % of silicon therein as a heavy medium and being used in the heavy media separation of minerals, wherein the heavy pulp is used in admixture with between 0.1 and 0.8 weight % of a carboxy-alkane-phosphonic acid being selected from acids having one of the following formulae: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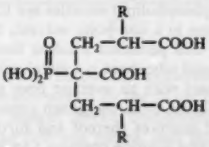
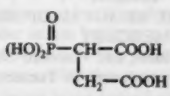

2)

in which R stands for hydrogen or alkyl having from 1 to 4 carbon atoms,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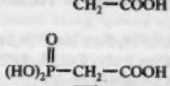
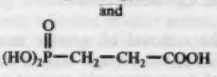

4)

and

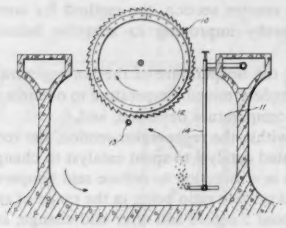

5)

4,093,539

ACTIVATED SLUDGE TREATMENT OF WASTEWATER

Carmen F. Guarino, Philadelphia, Pa., assignor to Autotrol Corporation, Milwaukee, Wis.

Filed May 12, 1976, Ser. No. 685,723
Int. Cl.[2] C02C *1/06, 1/10;* B01D *21/02*
U.S. Cl. 210—17 2 Claims



1. The method of improving the efficiency of an activated sludge wastewater treatment plant and of protecting it from destructive hydraulic surges which comprises:

(a) forceably aerating wastewater in an aeration tank,

(b) partially submerging a rotatable biological contactor in the aeration tank,

(c) recycling activated sludge to said aeration tank, and

(d) rotating said contactor to promote and support the growth upon said contactor of a filamentous, highly active and efficient biomass which includes as part of the biomass the living organisms normally present in activated sludge as well as those typically present on the surfaces of a rotatable biological contactor.

4,093,540

PURIFICATION PROCESS

Achintya Kumar Sen Gupta, Schenefeld Bez.Hamburg, Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,171
Claims priority, application United Kingdom, Nov. 13, 1975, 46893/75
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 F 44 Claims

1. A process for refining crude glyceride oil comprising the steps of:

(a) separating different molecular weight constituants of said crude oil into retentate and permeate fractions by ultrafiltering, under pressure, through a semipermeable membrane, a solution containing said crude oil in an organic solvent in which phospholipid micelles are formed; and

(b) passing, in solution in a non-polar solvent, the constituants contained in said permeate fraction through an adsorbant, wherein said adsorbant is a metal oxide or metalloid oxide adsorbant with an average pore size of 30 to 2,000 A and is selected from the group consisting of silicas, aluminas and mixtures thereof and further wherein said permeate fraction solution contains 5 to 90 percent by weight of oil.

4,093,541

METHOD FOR THE REMOVAL OF METALLIC MERCURY

Carlo Piccinini, Fano (Pesaro), and Vincenzo Conti, S.Ippolito, (Pesaro), both of Italy, assignors to Tecneco, S.p.A., Fano (Pesaro), Italy

Filed Sep. 30, 1976, Ser. No. 728,242
Claims priority, application Italy, Oct. 3, 1975, 27957 A/75
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—40 1 Claim

1. A method for the removal of metallic mercury from previously untreated industrial sewage waters containing it, comprising the step of contacting said sewage waters with activated carbon having a surface area of at least 350 square meters per gram.

4,093,542

FLOCCULATING AGENT COMPRISING WATER-IN-OIL EMULSION OF H-ACTIVE POLYMER CARRYING FORMALDEHYDE AND AMINE RADICALS

Kurt Dahmen, Rheydt; Wolfgang Hubner, Kempen, and Eduard Barthell, Krefeld, all of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Bakerfad, Germany

Continuation-in-part of Ser. No. 484,474, Jul. 3, 1974, abandoned. This application Jan. 2, 1975, Ser. No. 538,428
Claims priority, application Germany, Jul. 4, 1973, 2333927
Int. Cl.[2] B01D *21/01;* C08L *61/32*
U.S. Cl. 210—54 8 Claims

1. A flocculation, sedimentation, dehydration or retention composition comprising a stable dispersion of about 10 to 50% concentration by weight of a polymeric Mannich base in a mixture of water, a water-insoluble liquid and a quantity of an emulsifier of a suitable HLB number effective to produce a stable water-in-oil emulsion, the Mannich base comprising an H-active polymer carrying carbonamide groups reacted with formaldehyde and a primary or secondary alkyl or hydroxyalkyl amine wherein the alkyl groups have up to about 18 carbon atoms, said formaldehyde and said amine being employed in the reaction in approximately equimolar amounts, and said formaldehyde being present in at least about 0.1 times the molar amount of the carbonamide groups.

8. The process for clarifying an aqueous liquid having material suspended therein comprising mixing said aqueous liquid with a composition according to claim 1, and allowing said mixture to settle, whereby the suspended material settles out more rapidly than in the absence of said composition.

4,093,543

DECOMPOSITION OF FORMIC ACID IN VERY LOW CONCENTRATION

Paul G. Rodewald, Rocky Hill, and Werner O. Haag, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1976, Ser. No. 725,211
Int. Cl.[2] C02B *1/18*
U.S. Cl. 210—59 7 Claims

1. The process of increasing the pH of a very dilute solution of formic acid to 4.0 or higher which comprises contacting said solution with a heterogeneous formic acid decomposition catalyst consisting essentially of caustic on a solid inorganic substrate selected from the group consisting of alumina, titania-zirconia, titania, zirconia, silica, and mixtures thereof, at a temperature of from about 500° to 1200° F, said solution containing up to about 1.0 weight percent of formic acid.

4,093,544

METHOD AND APPARATUS FOR AMMONIA-NITROGEN REMOVAL BY VACUUM DESORPTION

David S. Ross, Lorain, Ohio, assignor to Sterling Drug, Inc., New York, N.Y.

Continuation of Ser. No. 247,262, Feb. 5, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,466
Int. Cl.[2] C01C *3/00;* C02C *1/02*
U.S. Cl. 210—59 29 Claims

1. A method for removing ammonia nitrogen from a body of wastewater having an upper surface, a given pH and a given temperature, said method comprising the steps of:

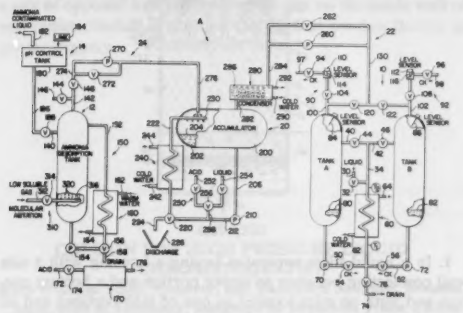
(a) increasing the pH of said wastewater to a highly basic condition;

(b) applying to said upper surface of said wastewater a vacuum corresponding approximately to the vapor pressure of said wastewater at said given temperature whereby ammonia is desorbed from said wastewater effluent;

(c) absorbing said desorbed ammonia in a body of liquid having a pH substantially less than said highly basic condition; and,

(d) introducing into said wastewater bubbles of a gas which is only slightly soluble in said wastewater.

4. An apparatus for removing ammonia nitrogen from wastewater having a given pH and a given temperature, said apparatus comprising means for increasing the pH of said wastewater; tank means for receiving said highly basic wastewater; means for creating a vacuum corresponding aproximately to the vapor pressure of said wastewater at said given temperature;



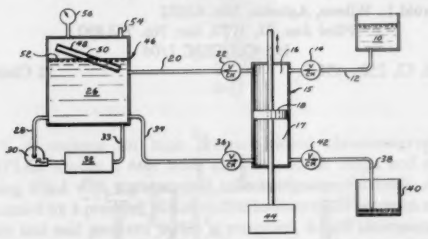
means for applying said vacuum to said tank means whereby ammonia is desorbed from said wastewater; means for introducing bubbles of a low soluble gas into said wastewater; means for directing said desorbed ammonia and said low soluble gas from said tank means; said vacuum creating means including a displacement tank, means for filling said tank with a liquid with an increasing liquid level, means for sealing said displacement tank, means for creating a vacuum in said sealed displacement tank by forcing said liquid therefrom, and means for communicating said vacuum from said displacement tank to said tank means; and, means for cooling said liquid in said displacement tank.

4,093,545

METHOD AND APPARATUS FOR DETERMINING THE AMOUNT OF ULTRAFILTRATION DURING DIALYSIS

Herbert M. Cullis, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 14, 1975, Ser. No. 550,051
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—86 **5 Claims**



1. In a dialysis system which includes dialysis solution conduit means for passing dialysis solution through a membrane dialyzer, the improvement comprising:

means for supplying and means for withdrawing essentially identical volumes of dialysis solution to and from a portion of said dialysis solution conduit means and a dialyzer connected to said conduit means, to precisely and positively control the input and output of dialysis solution to and from said conduit portion and connected dialyzer;

container means capable of holding a variable liquid volume and connected to said portion of the dialysis solution conduit means which is under precise positive control of the input and output of dialysis solution; and

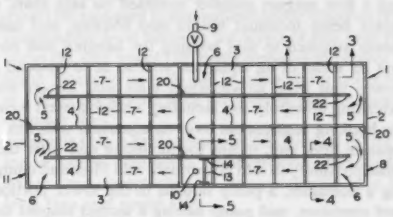
means for measuring the total liquid volume of dialysis solution in said precisely, positively controlled conduit portion and connected dialyzer, said total liquid volume being less than the entire liquid volume of dialysis solution in said dialysis system, whereby changes in said total liquid volume indicate the amount of ultrafiltration during dialysis; in which said means for supplying and means for withdrawing identical liquid volumes comprises double-faced piston means, reciprocable in a chamber, and defining a first, variable volume chamber portion adjacent one face of said piston, and a second, variable volume chamber portion adjacent the opposite face of said piston; a dialysis solution supply conduit, as part of said dialysis solution conduit means, communicating with said first chamber portion; first one-way valve means in said supply conduit for causing dialysis solution to be supplied to said first chamber as said piston causes its volume to expand, and to be expelled into said conduit portion and connected dialyzer as said piston causes said volume to contract, said second chamber portion communicating with a dialysis solution withdrawing conduit as part of said dialysis solution conduit means, and second one-way valve means for permitting dialysis solution to be withdrawn from said conduit portion and connected dialyzer into the second chamber as said piston causes the volume of said second chamber to expand, and for permitting dialysis solution to be expelled from said second chamber and from the dialysis system as the volume of said second chamber contracts, through reciprocating motion of said piston.

4,093,546

BIOLOGICAL FILTER

Jiri Taborsky, 5315 8th Ave., Bradenton, Fla. 33505

Filed Jun. 10, 1976, Ser. No. 694,721
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—150 **5 Claims**



1. Apparatus for cultivating organisms and for filtering water from a water source by use of the organisms to remove organic waste present therein comprising: a plurality of pan means including first pan means, said plurality of pan means each comprising a bottom portion and a rim portion extending in upwardly protruding relationship to said bottom portion, each of said plurality of pan means having rigidly secured therein a plurality of spaced apart divider means disposed adjacent the bottom portion of each of said pan means; said plurality of divider means being in substantially parallel relationship; one end of each of said parallel divider means abutting said rim portion with the opposite end of each of said parallel divider means being spaced apart from said rim portion, each successive divider means having said spaced apart end disposed in substantially reversed disposition relative to each preceding divider means forming a continuous extenuated channel between adjacent divider means; said continuous extenuated channel having an inlet for receiving water and an outlet disposed to pass water to drain means; said pan means being disposed in successively lower disposition than the next

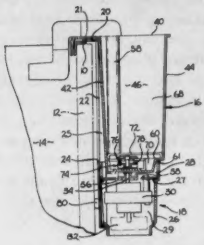
preceding pan means, the water source disposed to provide water to said inlet of said first pan means, said drain means formed within the bottom of each of said pan means and disposed in fluid communication with said inlet of the next subsequent successive pan means, whereby water flows along said extenuated channels of each of said pan means in successive order; and dam means transversely disposed relative to the sides of said channel and extenuating therebetween, said dam means extending vertically upward to a height less than said rim portion and said divider means whereby the flowing water is forced to pass over the upper longitudinal edge of said dam means and organic sediment present in the water is trapped.

4,093,547

MAGNETICALLY COUPLED AQUARIUM FILTER

Robert M. Sherman, Beverly Hills, and Charles O. Fuerst, Simi Valley, both of Calif., assignors to Aquaria, Inc., Van Nuys, Calif.

Filed Jan. 19, 1977, Ser. No. 760,590
Int. Cl.[2] E04H *3/16*
U.S. Cl. 210—169 **6 Claims**



1. In a filter apparatus for use with a home-type aquarium having a wall defining a rim, said filter apparatus having:

a power unit having a housing, a motor having a drive shaft and a first magnet member mounted on said shaft, said motor being mounted within said housing, and hanger means attached to said housing for hanging said power unit on a rim of an aquarium wall so as to suspend said power unit from an aquarium wall, said hanger means extending upwardly and including a hook-shaped member for hooking engagement over an aquarium wall rim,

a separate filter unit, means for mounting said filter unit in close proximity to said power unit, said filter unit comprising a container, a pump housed in the lower portion of said container, said pump having a second magnet member to be rotated by the magnetic field of said first magnet member for the rotation of the pump impeller; the improvement comprising:

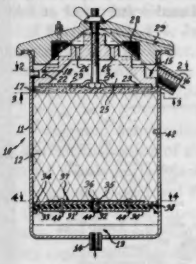
said means for mounting said filter unit with respect to said power unit includes an upward facing edge defined by the exterior surface of said hook-shaped member for hanging said power unit, hanger means mounted on said filter unit container for removable engagement with said upward facing edge of said hook-shaped member, said hanger means constructed and arranged for interlocking hooking engagement with said upward facing edge, and means mounted on said power unit housing for engaging the lower end of said separate filter unit container for providing accurate alignment of said first and second magnet members for transmitting power from said first magnet member to said second magnet member to drive said pump whereby said filter unit mounting means provides for removal of said separate filter unit without disturbing said power unit and the filter unit may be serviced by lifting it away from the power unit allowing it to retain its position on an aquarium rim.

4,093,548

LIQUID FILTER APPARATUS

Jon L. D. Sterkenburg, and George O. Kelbert, both of Jacksonville, Fla., assignors to Oil Refining Systems of Florida, Inc., Jacksonville, Fla.

Filed May 10, 1976, Ser. No. 684,749
Int. Cl.[2] B01D *3/28*
U.S. Cl. 210—180 **15 Claims**



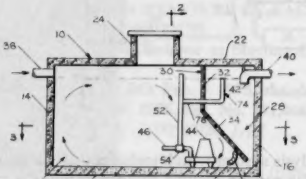
1. In a liquid filter apparatus having a housing with a side wall connecting between an upper portion and a bottom portion and with an inlet located in one of said portions and an outlet located in the other of said portions, a first rigid perforated plate fittingly disposed in said other end portion of said housing, a second rigid plate slidingly arranged in said one end portion of said housing, filter media for filtering fluid located in said housing between said plates, means for maintaining said first plate spaced from said outlet against the force of said filter media thereagainst, said second plate being disposed between said filter media and said inlet and having one face engaging said media and an opposite face facing said inlet and being constructed and arranged to sealingly slide along the interior surface of said side wall of said housing, said second plate having an aperture therethrough located spacedly inwardly of said side wall for the flow of fluid through said aperture to said filter media whereby, with channeling of said filter media and pressure drop within the interior of said filter media, fluid pressure on said opposite face of said second plate causes said second plate to slide in the direction toward said filter media to compress the filter media against said first plate and to close the channels causing such pressure drop.

4,093,549

AERATOR SEWAGE TANK

Harold L. Wilson, Antonia, Mo. 63052

Filed Jan. 31, 1977, Ser. No. 763,892
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—195 S **11 Claims**



1. A sewage treatment tank comprising an aeration compartment and a pump, said pump having an inlet receiving fluid and an outlet for discharging said fluid, means for aerating fluid discharged through the outlet of said pump comprising a pipe-like vertical conduit connected to a horizontal outlet conduit

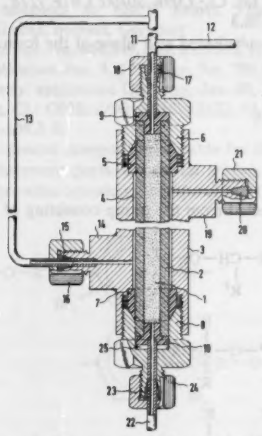
from said pump at a lower end and extending above the fluid level in the tank at an upper end for drawing air through said conduit by aspiration and mixing with the raw sewage pumped through the outlet of the pump to the aerating compartment, the lower end of the vertical conduit having an upstream side wall having a concave bottom protruding into an outlet conduit from said pump to provide a resticted area throat to increase the velocity of fluid flow past the vertical air conduit for aspirating air through said conduit and mix said air with the raw sewage fluid in said outlet conduit and said upstream side wall has a concave configuration terminating at the bottom in a pair of opposed foot portions which rest on the inside wall of said outlet conduit to position the vertical conduit therein in proper registry.

4,093,550

COLUMN FOR HIGH PRESSURE LIQUID CHROMATOGRAPHY

Kurt-Wilhelm Stahl, Hanover, and Ekkehard Schuppe, Ronnenberg, both of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Germany

Filed Jun. 1, 1976, Ser. No. 691,531
Claims priority, application Germany, Jun. 4, 1975, 2524751
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **4 Claims**



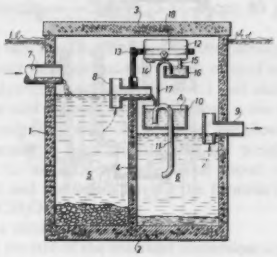
1. A column for high pressure liquid chromatography (HPLC) having a tube with an inlet and an outlet end and being filled with sorbent, said tube being concentrically surrounded by a pressure jacket so that an interspace between said tube and said pressure jacket is provided, which interspace is filled with the same medium as flows through the internal tube and the pressure in the interspace being equal to the pressure at the inlet of said tube, both ends of said interspace being sealed by means of packings surrounding said tube like stuffing boxes and sealing the interspace between said tube and said pressure jacket, and the interspace is connected by means of a pipe with the inlet end of said tube, a venting means is connected to the interspace, the pipe connected to the interspace opens up in a short pipe, the venting means is disposed on another short pipe mounted on the pressure jacket, and the two short pipes being mounted at opposite ends of the pressure jacket.

4,093,551

DEVICE FOR PURIFYING SEWER WATER IN SMALL SEWER SYSTEMS

Ülo Pääbo, Kristianstad, and Erik Horskjär Albertsen, Bromolla, both of Sweden, assignors to IFO AB, Bromolla, Sweden

Filed Nov. 29, 1976, Ser. No. 745,665
Claims priority, application Sweden, Dec. 11, 1975, 7514038
Int. Cl.[2] C02B *1/20;* **C02C** *5/02*
U.S. Cl. 210—201 **4 Claims**



1. A device for purifying sewer water in small sewer systems, said purifying device having no moving parts, comprising:

a sedimentation chamber (6) having an inlet (8) for receiving sewer water, means for receiving and holding water to be sedimented and an outlet (9) for removing sedimented water from said sedimentation chamber, said outlet (9) being mounted a predetermined distance above the bottom of said chamber (6) to provide a pool of water for sedimentation in said receiving means of said sedimentation chamber (6), and said inlet (8) being located at a higher level than said outlet (9);

a vessel (10) mounted in said sedimentation chamber (6) at an intermediate level between the levels of said inlet (8) and outlet (9), said vessel (10) being disposed to receive sewer water from said inlet (8) and to retain sewer water therein at a level above said pool of water in said sedimentation chamber (6);

a receptacle (16) in said sedimentation chamber (6) for holding a liquid containing sedimentation-promoting substance, said receptacle (16) being mounted at a higher level than said vessel (10);

a container (12) located completely above said receptacle (16) for supplying said liquid to said receptacle (16), said container (12) having a liquid outlet tube (15) connected adjacent its bottom but being otherwise provided with air-tight walls, said outlet tube (15) extending downwardly into said receptacle (16);

a first siphon tube (17) having an inlet in said receptacle (16) and a lower outlet in communication with said vessel (10) for supplying said liquid from said receptacle (16) to said vessel (10); and

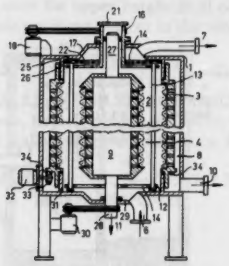
a second siphon tube (11) having an inlet within said vessel (10) and a lower outlet in said chamber (6) outside said vessel (10), said lower outlet of said second siphon tube (11) being located below the liquid level in vessel (10) and at a lower level than said outlet (9) of said sedimentation chamber (6), said lower outlet of said first siphon tube (17) being connected to the top portion of said second siphon tube (11) such that when suction is developed in said second siphon tube (11), suction is thereby developed in said first siphon tube (17) to supply said liquid to said sewer water.

4,093,552

FILTRATION APPARATUS

August Guyer, Zurich, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,221
Claims priority, application Switzerland, Dec. 11, 1975, 016075/75
Int. Cl.[2] B01D *33/02*
U.S. Cl. 210—297 7 Claims



1. Apparatus for filtering a suspension under pressure comprising

a. a housing containing an elongated, annular filtration chamber bounded by external and internal surfaces in the form of bodies of revolution,

b. each of said surfaces being formed as a filtering member and being provided with a filtrate discharge collector;

c. an inlet for introducing suspension under pressure to one end of said annular chamber and an axially spaced outlet for discharging filtered material from the opposite end of that chamber;

d. means defining a permeable agitating partition of cylindrical form which is located in, and extends longitudinally of, the annular chamber; and

e. drive means for rotating said partition,

f. the partition being spaced radially from each of said surfaces so that, during operation, a body of suspension in a turbulent state forms between the partition and each surface and is effective to keep solids from accumulating on the adjacent surface.

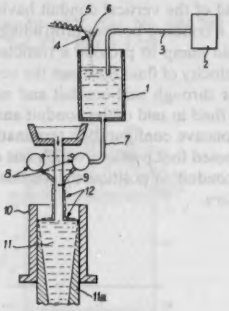
4,093,553

TREATING MOLTEN METAL WITH A MIXTURE OF A CRYOGENIC FLUID AND SOLID CARBON BLACK

Jean Galey, Voisins Bretonneux; Gérard Bentz, Elancourt-Trappes; Pierre Karinthi, Jouy-en-Josas; Ghislain Gilbert, Bures-sur-Yvette, and Serge Devalois, Fourqueux, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 30, 1975, Ser. No. 592,077
Claims priority, application France, Jul. 5, 1974, 74 23386
Int. Cl.[2] B22D *27/04*
U.S. Cl. 252—70 1 Claim

1. A composition of material intended for metallurgical treatments, comprising a body of at least one cryogenic fluid at its boiling temperature, and suspended in said body of cryogenic fluid finely divided carbon black in the form of particles having a size between 200 and 2,000 A, said cryogenic fluid being selected from the group consisting of nitrogen, helium, and argon, and said carbon black being present in said cryogenic fluid in a quantity between 10 and 1,000 grams per liter



of cryogenic fluid, whereby a homogeneous stable suspension is maintained in said cryogenic fluid.

4,093,554

HYDRAULIC FLUID COMPOSITIONS

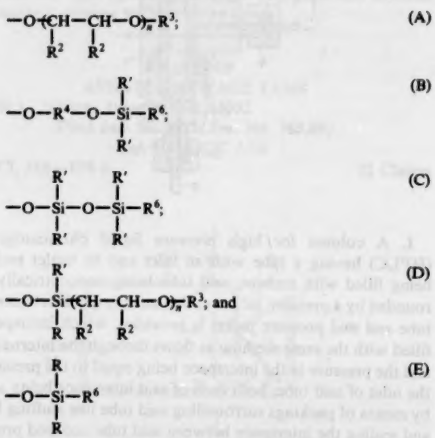
Gerald John Joseph Jayne; Herbert Frank Askew, and Colin John Harrington, all of Wokingham, England, assignors to Castrol Limited, Swindon, England

Filed Mar. 26, 1975, Ser. No. 562,253
Claims priority, application United Kingdom, Mar. 27, 1974, 13708/74
Int. Cl.[2] C09K *50/00*; C07F *7/18*
U.S. Cl. 252—78.3 44 Claims

1. A glycol-substituted aryl silane of the formula:

wherein (a) R is aryl;

(b) X is selected from the group consisting of



(A)

(B)

(C)

(D)

and

(E)

in which each R is defined above, R′ is as hereinafter defined, each R^2 is independently selected from the group consisting of hydrogen, methyl and ethyl provided that when any group R^2 is methyl or ethyl the group R^2 on the immediately adjacent carbon atom is hydrogen, R^3 is alkyl, R^4 is selected from the

group consisting of diol and polyol residues, R^6 is selected from the group consisting of aryl and alkyl, and n is an integer; and

(c) each R′ is, independently selected from the group consisting of groups of formula (A) as defined above, alkyl, aryl, and groups of the formula:

$$-O-R^5$$

wherein R^5 is alkyl and if the glycol-substituted aryl silane contains more than one group R^5 they may be the same or different; provided that the glycol-substituted arylsilane contains at least one group selected from the group consisting of

$$-O-R^4-O- \quad \text{and} \quad -O-\left(\begin{matrix}R^2\\|\\CH\end{matrix}-\begin{matrix}R^2\\|\\CH\end{matrix}-O\right)_n-$$

wherein R^2, R^4 and n are as defined above.

4,093,555

PRODUCTION OF DENTAL MODELS AND TOOTH REPLACEMENT PARTS

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, and Wolf-Dietrich Zahler, both of Hechendorf, all of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Seefeld, Germany

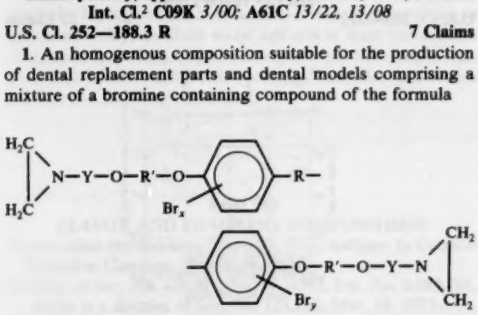
Continuation of Ser. No. 544,549, Jan. 27, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,925

Claims priority, application Germany, Jan. 30, 1974, 2404380

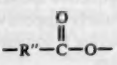
Int. Cl.² C09K *3/00;* **A61C** *13/22, 13/08*

U.S. Cl. 252—188.3 R **7 Claims**

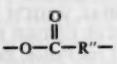
1. An homogenous composition suitable for the production of dental replacement parts and dental models comprising a mixture of a bromine containing compound of the formula



in which R is an alkylidene radical having 1 to 6 carbon atoms, a cycloalkylidene radical or a SO_2 radical, R′ is an alkylene radical having 2 to 6 carbon atoms or a cycloalkylene radical and —Y—O— is an acyloxy radical of the formula



and —O—Y— is an acyloxy radical of the formula



where R″ is an alkylene radical having 1 to 5 carbon atoms optionally bearing an aromatic substituent, and x is 1 or 2 and y is 0, 1 or 2; and at least one compound of the group consisting of the bromine-free analogs of the compounds.

4,093,556

PROCESS FOR MICROENCAPSULATION OF METALLOCENES

Stanley Wojciak, New Britain, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Jul. 2, 1975, Ser. No. 592,581

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **9 Claims**

1. A process for microencapsulating a water-insoluble metallocene comprising:

(a) providing an aqueous solution of a water-soluble precondensate of urea and formaldehyde wherein the precondensate concentration is about 15 to about 50 percent by weight;

(b) adding to said precondensate solution a particulate metallocene in such amount that the weight ratio of metallocene to precondensate is between about 1:1 and about 8:1;

(c) adding to said precondensate solution or the mixture of said precondensate solution with said metallocene a cationic surfactant in such amount that the weight ratio of surfactant to metallocene is between about 1:6,000 and about 1:10 said surfactant having the formula $t\text{-}C_{18\text{-}22}H_{37\text{-}45}NHCH_2CH_2OH$

(d) forming a slurry of the metallocene;

(e) adjusting the pH of the resultant dispersion to about 1 to about 6.5 by addition of a water-soluble acid, thereby causing polymerization of said precondensate, and

(f) continuing said polymerization in the temperature range of about 15° to about 80° C. until said metallocene particles are encapsulated with a shell of water-insoluble urea-formaldehyde polymer.

4,093,557

PROCESS FOR INHIBITING CORROSION OF METALS IN AQUEOUS SYSTEMS

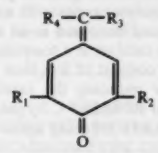
David C. Zecher, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 16, 1976, Ser. No. 723,676

Int. Cl.² C09K *3/00*

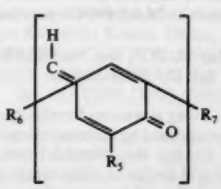
U.S. Cl. 252—389 R **11 Claims**

1. A process for inhibiting corrosion of metal surfaces in contact with recirculating water systems comprising maintaining within said systems from about 20 p.p.m. to about 200 p.p.m. by weight of a corrosion inhibiting composition containing a compound containing at least one quinomethide group selected from compounds of formula I



(I)

and resins of formula II which are at least partially oxidized phenolic resins containing at least one quinomethide group



(II)

in which formulas R_1 and R_5 are hydrogen, carboxyl, hydroxyl, $—SO_3H$, $—NH_2$ and alkyl and alkylene radicals having up to 8 carbon atoms; R_2 is hydrogen or lower alkyl having 1 to 4 carbon atoms; R_3 is hydrogen or lower alkyl having 1 to 4

carbon atoms, aryl or substituted aryl, R_4 is substituted aryl; R_6 and R_7 are residues of at least a partially oxidized phenolic resin.

4,093,558

MOLYBDATE CATALYSTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Robert C. Miller, Northfield, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 313,495, Dec. 8, 1972, abandoned, which is a Division of Ser. No. 67,269, Aug. 26, 1970, abandoned.
Filed Jul. 29, 1974, Ser. No. 492,374
Int. Cl.[2] B01J *21/02*
U.S. Cl. 252—432 **11 Claims**

1. A molybdate catalyst of the formula

$$A_a X_b Sb_c Mo_d O_e$$

wherein
A is selected from the group consisting of iron or iron and vanadium;
X is at least one element selected from the group consisting of aluminum, chromium, cobalt, nickel, copper, bismuth, tellurium, boron, phosphorus, titanium and tungsten;
and wherein
a is a number from 0.01 to 2,
b is a number from 0 to 3;
c is a number from 0.1 to 12;
d is 12; and
e is a number as determined by the combined valence requirement of the elements other than oxygen present in the catalyst.

4,093,559

PROCESS FOR THE PREPARATION OF A PALLADIUM CATALYST

Hans Fernholz, Fischbach, Taunus; Günter Roscher, Kelkheim, Taunus; Hans-Joachim Schmidt, Falkenstein, Taunus; Heinz Schmitz, Frankfurt am Main, and Friedrich Wunder, Florsheim, Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 2, 1976, Ser. No. 663,117
Claims priority, application Germany, Mar. 4, 1975, 2509251
Int. Cl.[2] B01J *27/20, 31/12, 21/18, 29/06*
U.S. Cl. 252—443 **17 Claims**

1. A process for the preparation of a palladium catalyst for the oxacylation of olefins in the gaseous phase, which comprises impregnating a catalyst carrier with a solution comprising a palladium compound dissolved in an unsubstituted carboxylic acid, drying the catalyst at a temperature below 90° C until a residual solvent content of less than 8% by weight is attained, and thereafter reducing the catalyst in a gaseous phase at a temperature of 40° to 260° C by passing a gas mixture containing an inert gas and a reducing agent over the catalyst.

4,093,560

ULTRA HIGH SILICON-CONTENT ZEOLITES AND PREPARATION THEREOF

George T. Kerr, Trenton, and Arthur W. Chester, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 20, 1976, Ser. No. 688,459
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 Z **11 Claims**

1. A method of removing aluminum from a crystalline aluminosilicate zeolite characterized by an initial silica/alumina ratio of at least about 2:1 but less than about 6:1 which comprises preparing a slurry of said zeolite in alkali metal or ammonium form in an aqueous solution of an ammonium or alkali metal salt which upon acidification yields an anion which complexes with aluminum, adding to said slurry a water-soluble acid having a first ionization constant greater than 10^{-2} at a rate such that between about 5 and about 15 percent aluminum is removed per day to yield a resulting product which at least about 70 percent and as much as about 85 percent of the initial aluminum has been removed while retaining more than about 60 percent of the original crystallinity.

9. A crystalline product obtained by the method of claim 1.

4,093,561

CATALYST FOR THE REDUCTION OF NITROGEN OXIDES AND METHOD FOR THE PRODUCTION THEREOF

Yasuo Nishikawa; Akira Watanabe; Tetsuya Sugimoto, all of Okayama; Kazuyasu Yabuki, Bizen, and Yoshio Hatayama, Kashihara, all of Japan, assignors to Kyushu Refractories Co., Ltd., Bizen, Japan

Filed Feb. 1, 1977, Ser. No. 764,533
Claims priority, application Japan, Feb. 10, 1976, 51-13732
Int. Cl.[2] B01J *21/04, 23/74*
U.S. Cl. 252—466 J **12 Claims**

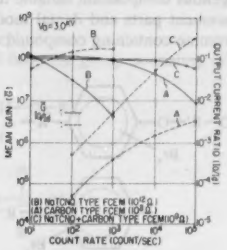
1. A catalyst for the reduction of nitrogen oxides obtained by calcining at least one particulate iron hydroxide at a temperature not exceeding 550° C and coating the calcined particles with an aqueous solution of an aluminum salt, washing, drying and molding the particles having the aluminum salt coating, followed by baking to form an alumina coating, said catalyst containing 60 to 90 percent by weight of Fe_2O_3 and 40 to 10 percent by weight of Al_2O_3 and having an average pore diameter of not more than 500 A, a pore volume of not less than 0.1 cc/g and a specific surface area of not less than 10 m^2/g.

4,093,562

POLYMERIC COMPOSITIONS FOR MANUFACTURE OF SECONDARY ELECTRON MULTIPLIER TUBES AND METHOD FOR MANUFACTURE THEREOF

Yoshi Kishimoto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 16, 1977, Ser. No. 769,014
Claims priority, application Japan, Feb. 20, 1976, 51-18072
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 **11 Claims**


Vo=3.0KV
MEAN GAIN (G)
OUTPUT CURRENT RATIO (IO/Ig)
(B) NOTCHO TYPE FCEM (IO=2.0 μA)
(A) CARBON TYPE FCEM (IO=2.0 μA)
(C) NOTCHO+CARBON TYPE FCEM(IO=2.0 μA)
COUNT RATE (COUNT/SEC)

1. A polymeric composition for the manufacture of a secondary electron multiplier, comprising
a polar type or electron donor matrix polymer having a secondary electron yield higher than unity and molecularly dispersive conductive molecules and less than 40% by volume of granularly dispersive conductive particles, said composition having a volume resistivity in the range of 10^5 to 10^{10} ohm-cm.

4,093,563

RESILIENT MATERIAL WHICH IS ELECTRICALLY CONDUCTIVE UNDER PRESSURE

Manford Leslie Eaton, 1 rue Fulton, Paris 13eme, France

Filed Sep. 23, 1975, Ser. No. 616,054
Claims priority, application France, Sep. 30, 1974, 74 32907
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—513 **16 Claims**

1. A two component composite resilient material consisting

essentially of between 10% and 80% by volume of a vulcanized one-phase homogeneous silicone polymer having a Shore A Durometer hardness of between 15 and 50, having dispersed therein between 20% and 90% of electroconductive metallic particles, and being electrically conductive under an applied pressure, said composite material being produced by admixing and then vulcanizing at room temperature and without applied pressure an admixture of room temperature vulcanization polymer having said particles dispersed therein;

said room temperature vulcanization silicone polymer being thixotropic and non-corrosive to said particles, having a density between 0.9 and 1.15 at 25° C, a viscosity of about 2,000,000 centiposes and being characterized by a shrinkage coefficient during vulcanization of between 0.1 and 0.5%; and

said metallic particles comprise at least one metal selected from the group consisting of noble metals, aluminum, nickel, copper, and tin, and have an apparent density between 0.2 and 6.0, a tapped density between 0.5 and 6.0, a specific surface between 1 and 850 cm^2/gram, a flow rate between 15 and ∞, an average diameter between 0.7 micron and 2,500 microns, a diameter distribution within the same range, and an atomic mass between 9.01 and 207.19.

4,093,564

ELECTROCONDUCTIVE COATINGS

William F. Moll, Jr., Summit, and Frank J. Botta, Linden, both of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Filed Feb. 14, 1977, Ser. No. 768,394
Int. Cl.² H01B *1/08*
U.S. Cl. 252—518 9 Claims

1. An electroconducting clay composition for electrophotography having solvent holdout characteristics comprising an expandable clay, an alkali metal salt and at least one organic compound from the group consisting of sugar and corn syrups, polyvinylacetate, acetylated polyvinylchloride, sulfonated polystyrene and fluorochemicals.

4,093,565

FLAVOR AND FRAGRANT COMPOSITIONS

Robert John Steltenkamp, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 414,394, Nov. 9, 1973, Pat. No. 3,989,765, which is a division of Ser. No. 125,792, Mar. 18, 1971, abandoned. This application Mar. 18, 1976, Ser. No. 668,025
The portion of the term of this patent subsequent to Dec. 2, 1993, has been disclaimed.
Int. Cl.² A61K *7/46*; C07C *1/20*
U.S. Cl. 252—522 4 Claims

1. A method of making a synthetic lime mix having the fragrance of steam distilled natural lime oil comprising the steps of refluxing a mixture of (A) citral or a citral-containing oil selected from the group consisting of lemongrass oil, Eucalyptus staigeriana and Litsea cubeba and (B) an acid selected from the group consisting of mineral acids and organic carboxylic acids and water for a period of from 1 to 3 hours, said acid being a catalyst and being present in a weight ratio of citral to acid of from about 1:1 to 20:1 which is effective to adjust the pH of said mixture to between 1.0 and 2.0; distilling the refluxed mixture and recovering from the distilled mixture a reaction-product consisting essentially of a major amount of terpene hydrocarbons and minor amounts of oxygen-containing compounds and 1-methyl-1,3-cyclohexadiene.

4,093,566

PHOSPHATE-FREE SPRAY CLEANER FOR METALS

Elizabeth L. MacNamara, Holland, and Fred Pearlstein, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 750,784
Int. Cl.² C11D *3/08, 3/10, 3/33*
U.S. Cl. 252—527 6 Claims

1. A metal cleaner composition essentially free from phosphates, consisting essentially of

about 50% by weight sodium metasilicate,
about 40% by weight sodium carbonate, and
about 10% by weight ethylenediamine tetraacetic acid disodium salt.

4. A metal cleaner composition essentially free from phosphates, consisting essentially of

about 50% by weight sodium metasilicate,
about 20% by weight sodium carbonate, and
about 30% by weight sodium hydroxide.

4,093,567

AMINATED CROSSLINKED COPOLYMERS OF BIS(CHLOROMETHYL) STYRENE WHICH EXHIBIT IMPROVED ANION EXCHANGE PROPERTIES

Marvin J. Hurwitz, Elkins Park, and Noyes L. Avery, Oreland, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 17, 1977, Ser. No. 759,950
Int. Cl.² C08F *2/18, 12/18, 12/34, 19/22*
U.S. Cl. 260—21 E 17 Claims

1. A crosslinked copolymer resulting from copolymerizing a monomer mixture of

(a) one or more monoethylenically unsaturated monomers, including bis-(chloromethyl)styrene which comprises at least about 5 weight percent of the mixture; and

(b) a polyethylenically unsaturated monomer which is present at between about 0.5 and about 50 weight percent of the mixture.

17. A process for preparing an amine functionalized anion exchange resin comprising copolymerizing by a suspension polymerization reaction a monomer mixture containing from about 5% to about 99.4% by weight of bis(chloromethyl)styrene, from about 0.1% to about 94.5% by weight of vinylbenzyl chloride, and from about 0.5% to about 30% by weight of a polyethylenically unsaturated crosslinker, and aminating the copolymer with an alkylamine having 2–3 alkyl groups which may be different from one another and which contain 1–5 carbon atoms each.

4,093,568

PROCESS FOR PRODUCTION OF PERFLUOROCARBON TYPE CATION EXCHANGE MEMBRANE

Maomi Seko; Yasumichi Yamakoshi, both of Tokyo; Hirotsugu Miyauchi, Kawasaki; Mitsunobu Fukumoto, Yokohama; Kyoji Kimoto, Yokohama; Itaru Watanabe, Yokohama, and Shigeo Yokoyama, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1976, Ser. No. 738,223
Claims priority, application Japan, Nov. 17, 1975, 50-137228
Int. Cl.² C25B *13/00*; C25C *7/04*
U.S. Cl. 260—2.2 R 12 Claims

1. A process for producing a cation exchange membrane, which comprises subjecting a cation exchange membrane containing perfluorocarbon polymers having pendant N-sulfonamide groups as represented by the formulas (I) and (II):

$$R_f-SO_2-N(R_2-X)-R_1-X \quad (I)$$

-continued

$$R_f-SO_2-N(X-R_2)-R_1-N(R_2-X)-SO_2R_f \quad \text{(II)}$$

wherein R_f represents a perfluorocarbon polymer chain, R_1 represents $-C_mH_{2m}-$ (where m is an integer of 1 to 6) or

R_2represents $-C_nH_{2n}-$ (where n is an integer of 0 to 6) and X represents hydrogen, amino group or hydroxyl group, to treatment with an oxidizing agent under conditions such that the concentration of the oxidizing agent is from 0.1 milliequivalents/liter to 10 equivalents/liter, at a temperature of from 5° C to 100° C at an oxidation potential of from 0.3 to 1.5 volt; the said pendant sulfonamide groups being present in a surface stratum containing at least 90% of said groups based on the total cation exchange groups in said stratum, the thickness of said stratum being from 0.2 to 200 μ.

4,093,569

POLYURETHANE RESINS PRODUCED FROM ACTIVE HYDROGEN CONTAINING MATERIAL WHICH IS A DISPERSION OF POLYISOCYANATE-POLYADDITION PRODUCTS IN HYDROXYL CONTAINING COMPOUNDS AS DISPERSING AGENTS

Artur Reischl, Leverkusen; Gert Jabs, Cologne, and Alberto Carlos Gonzalez-Dörner, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Germany

Filed Nov. 10, 1976, Ser. No. 740,452

Claims priority, application Germany, Nov. 12, 1975, 2550796

Int. Cl.[2] C08G *18/08*

U.S. Cl. 260—2.5 AM **3 Claims**

1. In a process for the production of polyurethane resins in which polyisocyanates are reacted with materials containing active hydrogen atoms and other known additives, the improvement wherein the active hydrogen containing material is a stable dispersion of non-ionic polyisocyanate-polyaddition products in hydroxyl containing compounds as dispersing agents which are formed by the process which comprises reacting

1. organic polyisocyanates with
2. compounds having primary and/or secondary amino groups and/or primary hydroxyl groups in
3. as dispersing agent, compounds having at least one hydroxyl group and a molecular weight of between about 62 and about 16,000 wherein

compounds (3) having secondary groups in cases where compounds (2) have primary hydroxyl groups, and wherein the components are reacted in the presence of more than 4% by weight of water, based on the quantity of reaction mixture including water.

4,093,570

PRODUCTION OF POROUS POLYMERS

Tetsuya Miyake, Tokyo; Kunihiko Takeda, Yokohama; Akihiko Ikeda, Yokohama, and Kazuo Imamura, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1976, Ser. No. 677,120

Claims priority, application Japan, May 1, 1975, 50-52911; May 10, 1975, 50-55238; Jun. 9, 1975, 50-69361; Jun. 9, 1975, 50-69362

Int. Cl.[2] C08J *9/00*

U.S. Cl. 260—2.5 B **37 Claims**

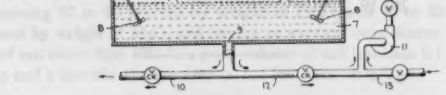
1. A method of producing a polar, porous polymer comprising polymerizing a monomer mixture comprising:

(A) about 2 to about 98 percent of at least one cross-linkable monomer having a plurality of $CH_2=C<$ groups and

(B) about 98 to about 2 percent by weight of at least one monomer selected from the group consisting of (i) copolymerizable monoethylenically unsaturated monomers and (ii) conjugated diene monomers, about 15 to about 100 percent by weight of the total monomers (A) and (B) being polar monomers,

in the presence of an organic medium which does not react with any of monomers (A) and (B), and selected from the group consisting of:

(I) a mixed organic liquid consisting essentially of at least one liquid selected from Group (i) and at least one liquid selected from Group (iii);



II. a mixed organic liquid consisting of at least one liquid selected from Group (i) and at least one liquid selected from Group (iii);

III. a mixed organic liquid consisting of at least one liquid selected from Group (ii) and at least one liquid selected from Group (iii); and

IV. one liquid selected from Group (iii);

wherein

Group (i) liquids dissolve all of the homopolymers of the monomers chosen;

Group (ii) liquids do not dissolve any of the homopolymers chosen, and

Group (iii) liquids dissolve at least one homopolymer of the monomers chosen but do not dissolve at least another homopolymer of the monomers chosen.

4,093,571

PROCESS FOR MAKING POROUS METAL CONTAINING POWDER COATING COMPOSITIONS

Marvin Gordon, Succassuna; Martin J. Hannon, Martinsville, and Henry H. George, Jr., Berkeley Heights, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 14, 1976, Ser. No. 649,128

Int. Cl.[2] C08J *9/30*

U.S. Cl. 260—2.5 B **13 Claims**

1. A process for preparing uncured curable porous metal particle-containing powder coating compositions useful in powder coating applications, which process comprises (a) atomizing by spraying a gas which is intermixed with a solution comprising a solvent, a resin which is melt extrudable and which will cure in the presence of a curing agent, a curing agent which will cross-link said resin upon the application of heat, and suspended metal particles to form droplets, and (b) collecting the sprayed droplets in a liquid bath wherein said liquid is miscible with said solvent but said liquid is a non-solvent for the solutes of the solution and wherein said liquid bath is subjected to a radial flow motion whereby said flow motion carries the particles away from one another thereby precipitating said powder coating compositions in substantially non-agglomerated form.

4,093,572

METHOD OF MAKING A STORAGE STABLE ISOCYANATE AND ITS USE

John R. White, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 4, 1976, Ser. No. 729,319
Int. Cl.[2] C08G 18/14
U.S. Cl. 260—2.5 AH 5 Claims

1. A storage stable liquid isocyanate composition consisting of a blend of about 0.2 to 0.4 parts of silicone block copolymer of ethylene/propylene with a liquid isocyanate composition that develops crystals on standing for 96 hours at 25° C., said silicone block copolymer having ability at 0.5 parts by weight in 100 parts of said isocyanate composition to reduce surface tension of said isocyanate composition to less than 40 dynes/-centimeter as measured by Cenco-DuNony Interfacial Tensiometer at 25° C.

4,093,573

LOW-VISCOUS, STABLE POLYMER DISPERSIONS AND POLYURETHANES PREPARED THEREFROM

Gerhard G. Ramlow, Grosse Ile; Louis C. Pizzini, Trenton; John T. Patton, Wyandotte, and John R. Murphy, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 465,072, Apr. 29, 1974, Pat. No. 4,014,846.
This application Jan. 17, 1977, Ser. No. 759,978
Int. Cl.[2] C08G 18/63
U.S. Cl. 260—2.5 BE 12 Claims

1. A polyurethane prepared by the reaction of an organic polyisocyanate with a low-viscous polymer disperson prepared by blending:

(a) from 45 to 95 weight percent of a polyol having an equivalent weight of from 500 to 10,000 with

(b) from 55 to 5 weight percent of a hydroxy-containing finely-divided solid polymer obtained by polymerizing in the presence of a free radical catalyst and an organic solvent:

(1) about 55 to 95 weight percent of an ethylenically unsaturated monomer or mixture of monomers and

(2) from about 45 to 5 weight percent of a hydroxy-terminated organic compound having from one to eight hydroxyl groups, a hydroxyl equivalent weight of from 500 to 10,000 and containing a polymerizable carbon-to-carbon double bond, said weight percents being based on the total weight of (1) and (2).

2. The polyurethane of claim 1 prepared in the presence of a blowing agent.

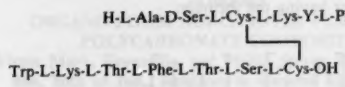
4,093,574

SOMATOSTATIN ANALOGS AND INTERMEDIATES THERETO

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 2, 1977, Ser. No. 763,943
Int. Cl.[2] C08L 37/00; C07C 103/52; A61K 37/00
U.S. Cl. 260—8 19 Claims

1. A compound selected from those of the formula



and their pharmaceutically acceptable non-toxic acid addition salts, and intermediates to said compounds, said intermediates having the formula R-L-Ala-D-Ser(R_4)-L-Cys(R_1)-L-Lys(R_2)-Y-L-Phe-L-Phe-D-Trp(R_5)-L-Lys(R_2)-L-Thr(R_3)-L-Phe-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

Y is L-Asn or L-Ala;

R is hydrogen or an α-amino protecting group;

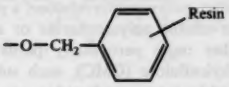
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an ε-amino protecting group;

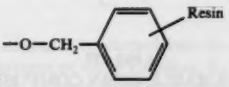
R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, each of R, R_1, R_2, R_3, R_4, and R_5 is hydrogen, and, when X is



each of R, R_1, R_2, R_3, and R_4 is other than hydrogen.

4,093,575

THERMOSETTING VINYL CHLORIDE POLYMER POWDER COATINGS

Joseph Weldon Hagan, Warren, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,541
Int. Cl.[2] C08L 1/14
U.S. Cl. 260—15 5 Claims

1. A thermosetting vinyl chloride polymer powder coating composition comprising finely divided particles; wherein the powder particles are of a blend of constitutents consisting essentially of:

A. 40 to 90 percent by weight of said composition of a vinyl chloride polymer having pendant hydroxyl groups consisting essentially of

i. 75 to 95 percent of weight, based on the weight of said vinyl chloride polymer, of vinyl chloride,

ii. 2 to 20 percent by weight, based on the weight of said vinyl chloride polymer, of an hydroxyalkyl acrylate having from 2 to 6 carbon atoms in the alkyl group, or the vinyl alcohol moiety,

iii. 0 to 23 percent by weight, based on the weight of said vinyl chloride polymer, of vinyl acetate;

wherein the vinyl chloride polymer has a number average molecular weight of from 5,000 to 25,000 and a glass transition temperature above 40° C.;

B. 3 to 60 percent by weight of said vinyl chloride polymer of a melamine formaldehyde resin, urea formaldehyde resin, phenol formaldehyde resin, or blocked isocyanate crosslinker; and

C. 10 to 30 percent by weight of said composition of cellulose acetate butyrate having a butyral content of from 45 to 60 percent.

4,093,576

MIXTURE FOR ANCHORING BONE IMPLANTS

Joost Robert deWijn, Nijmwegen, Netherlands, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 5, 1976, Ser. No. 673,354
Claims priority, application Switzerland, Apr. 18, 1975, 4970/75
Int. Cl.[2] C08L 1/28
U.S. Cl. 260—17 R 14 Claims

1. A doughy mixture for anchoring implants and prosthetic joint ends in bones, said mixture comprising

a water-insoluble composition of a filler consisting of at least one polymethylmethacrylate (PMMA) polymer in powder form and a polymerizing liquid monomeric methylmethacrylate (MMA) monomer; and

a biologically compatible high-viscosity gel of 200,000 centipoise or more in admixture with said water-insoluble

composition to form a dispersion of said composition with said gel, said gel being soluble in water and in body fluid and being selected from the group consisting of polyvinyl-alcohol (PVAL), polyhydroxy alkylmethacrylate, polyvinylmethyl ether, polyvinylpyrrolidone, a polyacrylic acid salt, a water-soluble polysaccharide or a water-soluble cellulose ether more particularly partially neutralized carboxymethylcellulose (CMC); such substance having been dissolved in an aqueous liquid in a quantity of from 3 to 60 percent by weight.

4,093,577

PHOTOCURABLE RESIN COMPOSITIONS

Ryozo Konno; Akira Ikeda; Toshimitsu Ugai, and Akio Hirose, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,650

Claims priority, application Japan, Mar. 5, 1976, 51-23108; Mar. 9, 1976, 51-24697; Mar. 9, 1976, 51-24698

Int. Cl.[2] C09D *3/64, 5/32, 11/10*

U.S. Cl. 260—22 CB **17 Claims**

1. A photocurable resin composition comprising (1) 1 to 90% by weight of a photopolymerizable photosensitizing compound prepared by esterifying with an ethylenically unsaturated fatty acid a resin having an OH equivalent of 150 - 500 produced by esterification of a dialkylaminobenzoic acid and a polybasic acid with a polyhydric alcohol, (2) 99 to 5.2% by weight of a photopolymerizable monomer and (3) 0 to 4.8% by weight of a photosensitizing agent, the percentages being based on the weight of said resin composition.

4,093,578

SELF-LUBRICATING ANTIFRICTION MATERIAL

Jury Nikolaevich Vasiliev, ulitsa Vostrukhina 6, korpus 3, kv. 67, Moscow; Andrei Viktorovich Petrenko, Pushkino, Moskovsky prospect, 43, kv. 17, Moskovskaya oblast; Georgy Nikolaevich Bagrov, Mozhaiskoe shosse, 74, kv. 87, Moscow; Galina Nikolaevna Gordeeva, Kosinskaya ulitsa, 18, korpus 2, kv. 56, Moscow; Timur Isaakovich Kazintsev, 3 Dorozhny proezd, 9, kv. 50, Moscow; Vasily Dmitrievich Telegin, Ljubertsy Oktyabrsky prospekt 306, kv. 71, Moskovskaya oblast, and Vitaly Naumovich Goldfain, Kuznetsovskaya ulitsa, 10, korpus 3, kv. 39, Leningrad, all of U.S.S.R.

Filed Feb. 27, 1976, Ser. No. 662,202

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28 P **2 Claims**

1. A self-lubricating antifriction material comprising a carbon filler selected from the group consisting of a powder of fired oil coke, a powder of artificial graphite and carbon fabric; a binder in the form of epoxy resin having a molecular weight of 300–1560 obtained through condensation of epichlorohydrin with diphenylolpropane and polyalumophenylsiloxane resin having a molecular weight of 5000–15000 with a mole ratio of the silicon atoms to the aluminium atoms equal to 3–8; chlorinated paraffin having a molecular weight of 500–1100 and chlorine content of 40–70 mole percent; the proportion of said components in said self-lubricating antifriction material being as follows (% by weight):

epoxy resin — 15 - 57

polyalumophenylsiloxane resin — 3 - 10

chlorinated paraffin — 0.2 - 10

carbon filler — the balance

4,093,579

LOW PRESSURE MELAMINE RESINS CONTAINING AN ETHYLENE GLYCOL AND AN ELASTOMER

Darwin Fiske DeLapp, New Canaan; James Christopher Goebel, Stamford, both of Conn., and Kenneth Dana Bunkowski, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,722

Int. Cl.[2] C08L *61/28*

U.S. Cl. 260—29.4 R **5 Claims**

1. A composition of matter comprising

(1) a blend of an aqueous melamine/formaldehyde resin solution and from about 2 to about 20%, by weight, based on the solids weight of said resin, of an ethylene glycol having a molecular weight of from about 62 to about 2100, or

(2) an aqueous solution of the resinuous reaction product of (I) melamine, (II) formaldehyde and (III) from about 2 to about 20.0%, by weight, based on the total weight of melamine and formaldehyde, of an ethylene glycol having a molecular weight of from about 62 to about 2,000, wherein said (1) or (2) contains, in admixture therewith, (3) from about 2.5 to about 30.0%, by weight, based on the weight of resin solids in (1) or (2), of an elastomer comprising

(a) an ethylene/vinyl chloride containing from about 20 to about 30% ethylene, from about 65 to about 80% vinyl chloride and from about 0.5 to about 7.0%, by weight, said percentages being based on the total weight of (a), of amide groups,

(b) a polyurethane resin containing from about 3.0 to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups, or

(c) a butadine/acrylonitrile copolymer containing from about 50 to about 95% butadiene, from about 5 to 50% acrylonitrile and from about 1 to about 10%, by weight, said percentages being based on the total weight of (c), of carboxyl groups,

said elastomer having a particle size of up to about 20,000 Angstroms.

4,093,580

METHOD FOR TREATING AQUEOUS MEDIUMS CONTAINING MAGNESIUM SULFITE TRIHYDRATE

Robert L. Jones, Newtown; Lewis Volgenau, Ivyland, and Philip S. Davis, Furlong, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

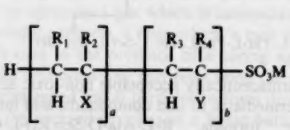
Filed Aug. 5, 1976, Ser. No. 711,914

Int. Cl.[2] C08L *41/00*; C02B *5/06*

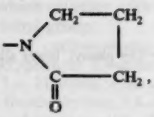
U.S. Cl. 260—29.6 SQ **30 Claims**

1. A method for dispersing magnesium sulfite tri-hydrate contained in an aqueous medium comprising adding in combination to the medium an effective amount for the purpose as a dispersant of

(i) an oligomer having the formula:

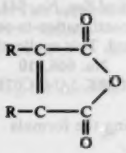


where R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl, Y is at least one member selected from the group consisting of —COOH, —COOM, —$CONH_2$, —OCH_3, —OC_2H_5, —CH_2OH, and



X is one or more members selected from the group consisting of $-COOC_2H_4OH$, $-COOC_3H_6OH$, $-CONHCH_2OH$, $-CONHCH_3$, $-CONHC_2H_5$, $-CONHC_3H_7$, $-CONHC_8H_{17}$, $-COOCH_3$, $-COOC_2H_5$, $-CN$, $-OOCCH_3$, $-OOCC_2H_5$, and $-CONHC(CH_3)_2-CH_2COCH_3$, $a+b$ is 4 to 250, $a/(a+b)$ is between 0.0 and 0.6, and M is a water soluble cation of a bisulfite salt; and

(ii) an effective metal salt of a copolymer of a 1-olefin having from 4 to 16 carbon atoms and a compound having the formula:



where R is individually selected from the group consisting of hydrogen, methyl and ethyl.

4,093,581

EMULSION POLYMERIZATION OF VINYL CHLORIDE USING PREHOMOGENIZED MIXED EMULSIFIER SYSTEM

Donald F. Anderson, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 11, 1976, Ser. No. 740,989

Int. Cl.² C08L *27/06*

U.S. Cl. 260—29.6 MH **8 Claims**

1. In an emulsion polymerization procedure for forming vinyl chloride homopolymers or copolymers by heating a monomer charge containing vinyl chloride in the presence of a water soluble initiator and an emulsifier to form a latex containing particles of said polymers, the improvement which comprises using as an emulsifier, a prehomogenized mixture of: (1) at least one C_{12}-C_{18} straight chain alkyl or alkenyl surfactant of the formula $ROSO_3A$ or $RC(O)OA$, where R is a C_{12}-C_{18} straight alkyl or alkenyl group and A is an alkali metal cation, alkaline earth metal cation or alkanol amine of up to 6 carbon atoms and (2) at least one C_{16}-C_{20} straight chain alkyl or alkenyl alcohol or saturated hydrocarbon having a chain of greater than 18 carbon atoms to effect formation of the polymers in said latex in a single step.

4,093,582

ORGANO PHOSPHORUS ESTER PLASTICIZED POLYCARBONATE COMPOSITION

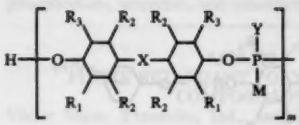
Victor Mark, Evansville, and Phillip Steven Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

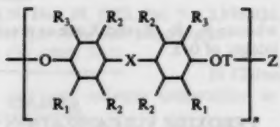
Filed Dec. 8, 1976, Ser. No. 748,469

Int. Cl.² C08K *5/51*

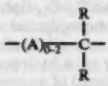
U.S. Cl. 260—30.6 R **6 Claims**

1. A plasticized polycarbonate composition comprising in admixture, a high molecular weight aromatic carbonate polymer having an IV of 0.40 to 1.0 dl./g. in methylene chloride at 25° C and a minor amount of an oligomeric-polymeric organo phosphorus ester of the following formula:





wherein R_1 is independently selected from the group consisting of hydrogen, halogen or C_1 to C_{12} alkyl; R_2 is independently selected from the group consisting of hydrogen or C_1 to C_5 alkyl; R_3 is independently selected from the group consisting of hydrogen, halogen or C_1-C_2 alkyl; X is selected from the group consisting of:



(a)

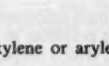
wherein A is

and R_4 is hydrogen or C_1-C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1-C_{15} alkyl; aryl or 6–14 carbon atoms and substituted aryl wherein the substituents are C_1-C_3 alkyl;

(b) $-CH_2CH_2-$

(c) $-CH_2B\text{-}CH_2-$

wherein B is C_1-C_{16} alkylene or arylene of 6 to 14 carbon atoms;



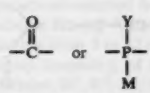
(d)

wherein a is an integer of 3 to 15;

(e) $-O-$

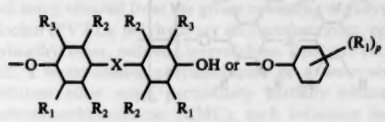
(f) $-S-$

Y is O, S or an electron pair; M is selected from the group consisting of C_1-C_{30} alkyl, aryl of 6 to 14 carbon atoms, C_1-C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, alkylamino of 1 to 30 carbon atoms, arylamino of 6 to 14 carbon atoms and substituted aryl wherein the substituents are C_1 to C_{30} alkyl, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms, arylthio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms; T is



wherein Y and M are as previously defined; m and n are inte-

gers from 0 to 80 provided the sum of m and n is at least 2; and Z is



wherein R_1, R_2, R_3 and X are as previously defined and p is an integer of 0–5.

4,093,583

PEROXIDE VULCANIZATION OF OIL-EXTENDED ELASTOMERIC ETHYLENE COPOLYMERS CONTAINING BROMINE

David Apotheker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1976, Ser. No. 728,003
Int. Cl.[2] C08K *5/01*
U.S. Cl. 260—33.6 AQ 14 Claims

1. An elastomeric peroxide vulcanizable copolymer composition of ethylene, at least one C_3–C_{18} alpha-monoolefin, and at least one monoreactive nonconjugated diene containing at least about 0.1 weight percent allylically incorporated bromine, at least about 20 phr of a hydrocarbon extending oil, about 1–5 phr (active ingredient) of an organic peroxide and an unsaturated peroxide activator.

4,093,584

PROCESS FOR THE MASS COLORATION OR WHITENING OF LINEAR POLYESTERS

Günther Zwahlen, Dornach; Gerhard Umsonst, Frenkendorf, and Andreas Laely, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,559
Claims priority, application Switzerland, Dec. 18, 1974, 16889/74
Int. Cl.[2] C08K *9/04*
U.S. Cl. 260—40 P 6 Claims

1. A process for the mass colouration or whitening of linear polyesters, wherein the polyester to be coloured is mixed, in the solid or fused state, with a preparation consisting substantially of a colourant or fluorescent brightener which is soluble or insoluble in the polyester, and of a polystyrene with a softening point above 100° C, and the resultant mixture, provided it is not already in the form of a melt, is converted into the molten state and formed into shaped articles.

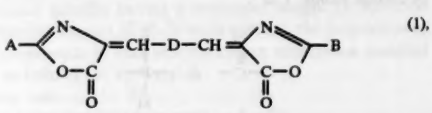
4,093,585

PROCESS FOR THE DYEING OF WATER-INSOLUBLE THERMOPLASTIC POLYMERS AND POLYCONDENSATES IN THE MASS

Wolfgang Teige, Kelkheim, Taunus, and Rudolf Schickfluss, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

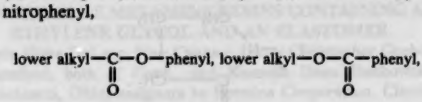
Filed Feb. 28, 1977, Ser. No. 772,576
Claims priority, application Germany, Mar. 2, 1976, 2608481
Int. Cl.[2] C08K *5/35*
U.S. Cl. 260—40 P 6 Claims

1. Process for the dyeing of a water-insoluble thermoplastic polymer or polycondensate in mass, which comprises adding to the said thermoplastic material before the final molding thereof an azlactone dyestuff of the formula (1)



(1),

in which A and B each represents naphthyl, phenyl, chlorophenyl, bromophenyl, lower alkyl-phenyl, lower alkoxyphenyl, nitrophenyl,



cyanophenyl, dichlorophenyl, chloro-lower alkyl-phenyl, nitro-lower alkyl-phenyl, chloro-nitrophenyl, A and B being identical or different, D represents naphthylene, phenylene, monochlorophenylene, dichlorophenylene or di-lower alkoxyphenylene, or with a mixture of dyestuffs of the said formula (1).

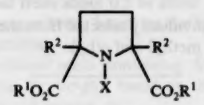
4,093,586

PYRROLIDINE DICARBOXYLIC ACIDS AND ESTERS AND STABILIZED COMPOSITIONS

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 541,373, Jan. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 429,328, Dec. 28, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,010
Int. Cl.[2] C08K *5/34*; C07D *207/04*
U.S. Cl. 260—45.8 N 31 Claims

1. A compound having the formula



wherein

X is hydrogen, hydroxyl, O, alkyl having 1 to 12 carbons, $CH_2CH_2OCH_3$, alkenyl having 3 to 4 carbons or $CH_2C{=}CH$;

R^1 is hydrogen, alkyl having 1 to 20 carbons or phenethyl; and

R^2 are the same or different alkyls having 1 to 7 carbons.

16. A composition of matter stabilized against degradation which comprises a synthetic organic polymer subject to ultraviolet light degradation and a compound of claim 1.

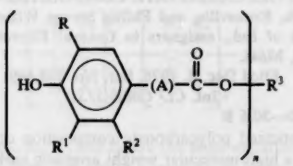
4,093,587

TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACID ESTER AND AMIDE STABILIZED COMPOSITIONS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 490,835, July 23, 1974, Pat. No. 3,984,460, which is a continuation-in-part of Ser. No. 400,745, Sept. 25, 1973, abandoned. This application May 3, 1976, Ser. No. 682,236
Int. Cl.[2] C08K *5/20*
U.S. Cl. 260—45.8 NE 22 Claims

1. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of a stabilizing compound of the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms or together are a butylene chain which together with the phenyl ring form a tetrahydronaphthyl group,

R^3 is alkyl of 1 to 18 carbon atoms; cyclohexyl; phenyl; o-tolyl; p-tert-octyphenyl; 2,4-di-tert-butylphenyl; 2-(alkylthio)ethyl of 5 to 21 atoms in the chain; alkylene of 2 to 6 carbon atoms, thiodiethylene, 3,6-dioxa-1,8-octa-methylene; or a polyvalent saturated aliphatic hydrocarbon radical of 3 7 carbon atoms where *n* is 3 or 4,

A is a straight chain alkylene of 1 to 3 carbon atoms, and *n* is an integer of 1 to 4.

4,093,588

HINDERED PHENOLIC CYCLIC PHOSPHONATES AND STABILIZED COMPOSITIONS

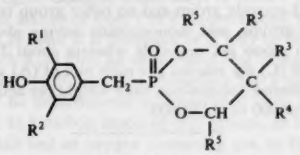
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 512,373, Oct. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 421,173, Dec. 3, 1973, abandoned. This application Sep. 3, 1976, Ser. No. 720,304

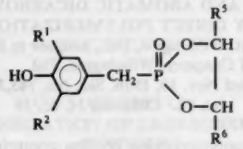
Int. Cl.[2] C08K *5/53*; C07F *9/15*

U.S. Cl. 260—45.8 R **10 Claims**

1. A compound having the formula



or



wherein

R^1 is alkyl of 1 to 8 carbon atoms,

R^2 is tert-alkyl of 4 to 8 carbon atoms,

R^3 and R^4 are independently hydrogen or alkyl of 1 to 12 carbon atoms,

R^5 is hydrogen, alkyl of 1 to 8 carbon atoms or phenyl and providing that each R^5 does not have to be the same, and

R^6 is alkyl of 1 to 8 carbon atoms or phenyl, or R^5 and R^6 together represent tetramethylene.

2. A composition of matter comprising a polyamide subject to oxidative and thermal deterioration stabilized with from 0.01 to 5% by weight of a compound of claim 1.

4,093,589

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Arnold Factor, Scotia, N.Y.; Donald Benjamin George Jaquiss, New Harmony, and Victor Mark, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 3, 1977, Ser. No. 765,363

Int. Cl.[2] C08K *5/42*

U.S. Cl. 260—45.75 B **9 Claims**

1. A non-opaque flame retardant polycarbonate composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the organic cationic salts of unsubstituted and substituted monomeric or polymeric aliphatic, aromatic or heterocyclic sulfonic acids and mixtures thereof and inorganic acids, the cationic porion of said organic cationic salt being selected from substituted or unsubstituted carbonium, sulfonium, ammonium, phosphonium, arsonium, and iodonium cations.

4,093,590

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 429,126, Dec. 28, 1973, Pat. No. 3,978,024. This application Jul. 14, 1976, Ser. No. 705,025

Int. Cl.[2] C08K *5/42*

U.S. Cl. 260—45.85 S **11 Claims**

1. A flame retardant carbonate polymer composition selected from the group consisting of:

(a) a carbonate polymer having in admixture a minor amount of an additive selected from the group consisting of the metal salts of unsubstituted and substituted polymeric phenol ester sulfonic acid, and mixtures of the metal salts of unsubstituted and substituted monomeric phenol ester sulfonic acid and the metal salts of unsubstituted and substituted polymeric phenol ester sulfonic acid wherein the metal salts are selected from the group consisting of the alkali metal salts and alkali earth metal salts and mixtures of these metal salts, and the substituent on the metal salts of the substituted monomeric and polymeric phenol ester sulfonic acid is selected from the group consisting of an electron withdrawing radical, and mixtures of electron withdrawing radicals,

(b) a metal salt of a sulfonic acid substituted carbonate polymer wherein said metal salt comprises from 0.01 to up to 10.0 weight percent of said polymer, and

(c) mixtures of (a) and (b).

4,093,591

3,5-DITERTIARY ALKYL-4-HYDROXYPHENYL (ALKYL) 6-ACYLOXY-4-THIA HEXANOATES AND HEXENAMIDES AS ANTIOXIDANTS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 8, 1976, Ser. No. 739,687

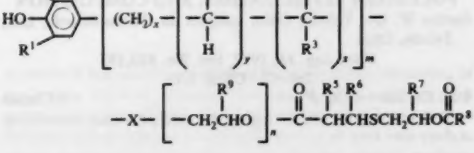
Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—45.85 H **4 Claims**

1. A composition of matter stabilized against oxidative degradation which is comprised of:

A. a polymer susceptible to oxidative degradation selected from the group consisting of natural rubber, homopolymers wherein the monomer is selected from the group consisting of mono-olefin monomers and diolefin monomers, and synthetic copolymers wherein at least one of the monomers is selected from the group consisting of mono-olefin monomers and diolefin monomers; and

B. from 0.001 to 10 parts by weight of the anti-oxidant having the following structural formula:



wherein R and R^1 are radicals selected from the group consisting of tert. alkyl radicals having from 4 to 8 carbons, and cycloalkyl radicals having from 5 to 12 carbons; R^2 and R^3 are selected from the group consisting of H, and alkyl radicals having from 1 to 4 carbons; R^4, R^5, R^6, R^7 and R^9 are selected from the group consisting of H and alkyl radicals having from 1 to 4 carbons; R^8 is selected from the group consisting of alkyl

radicals having from 1 to 20 carbons, alkenyl radicals having from 12 to 20 carbons, cycloalkyl radicals having from 5 to 12 carbons, phenyl, substituted phenyl, and aralkyl radicals having from 7 to 12 carbon atoms; x, y or z equals 0 to 12; $x + y + z \leqq 12$; m equals 0 or 1; n equals 0 to 3; and X is 0 or NH per 100 parts by weight of polymer.

4,093,592

NOVEL PHENOLIC ANTIOXIDANTS, THEIR PREPARATION AND THEIR USE

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

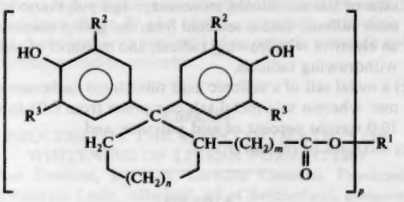
Filed Mar. 17, 1977, Ser. No. 778,706

Claims priority, application Germany, Mar. 23, 1976, 2612214

Int. Cl.[2] C07C *69/76;* C08K *9/00*

U.S. Cl. 260—45.85 B **5 Claims**

1. 2,2-Bis-(alkyl-4'-hydroxyphenyl)cycloalkyl-(alkyl)-carboxylic acid ester of the formula



wherein

m is o, 1 or 2,

n is an integer of from 2 to 9 and

p is 1, 2, 3 or 4,

R^1 is an alkyl or isoalkyl radical with up to 30 carbon atoms, the valency of which corresponds to the meaning of p in each case, or a mono- or bivalent, optionally alkylsubstituted cycloalkyl radical having of from 5 to 12 ring carbon atoms, or a monovalent alkene or alkyne radical having of from 3 to 30 carbon atoms,

R^2 is an alkyl or isoalkyl radical having up to 4 carbon atoms and

R^3 is hydrogen or an alkyl or isoalkyl radical having up to 4 carbon atoms.

4,093,593

POLYESTER STABILIZATION, AND COMPOSITION

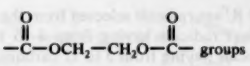
Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 14, 1977, Ser. No. 833,192

Int. Cl.[2] C08K *5/09*

U.S. Cl. 260—45.85 P **2 Claims**

2. A method for stabilizing a saturated polyester containing



which comprises forming an intimate admixture of said polyester with 0.3 to 3 parts by weight of 5-hydroxy isophthalic acid per 100 parts by weight of said polyester.

4,093,594

PROCESS FOR PREPARING CATHODICALLY DEPOSITABLE COATING COMPOSITIONS

Terry L. Anderson, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Aug. 18, 1976, Ser. No. 715,267

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—47 EP **10 Claims**

1. A process for preparing a resinous composition which comprises

(A) adducting

(a) a polyepoxide resin derived from a dihydric phenol and an epihalohydrin, said polyepoxide resin having a 1,2-epoxide equivalent weight of about 400 to about 4000, with

(b) a polyamine having at least 2 amine nitrogen atoms per molecule, at least 3 amine hydrogen atom per molecule and no other groups reactive with epoxide groups; and wherein at least 1.5 mols of (b) are present for each epoxide equivalents of (a) and wherein the reaction is continued until all of the epoxide groups have reacted with amine groups;

(B) removing by distillaton the unreacted polyalkylene polyamine; and

(C) reacting at a temperature of about 150° to about 500° F. the so formed adduct with a monoepoxide which contains one 1,2-epoxide group and no other group reactive with amine groups, said monoepoxide having about 8 to 24 carbon atoms per molecule wherein about 2 to about 6 mols of (C) are reacted per each mol of (A) and wherein said resinous composition has a weight per active nitrogen of about 200 to about 600.

4,093,595

PROCESS FOR PREPARING POLYESTERS FROM DIPHENOLS AND AROMATIC DICARBOXYLIC ACIDS BY DIRECT POLYMERIZATION

Steven P. Elliott, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1976, Ser. No. 743,320

Int. Cl.[2] C08G *63/14, 63/18*

U.S. Cl. 260—47 C **13 Claims**

1. A direct polymerization process comprising reacting a composition consisting essentially of at, least one aromatic dicarboxylic acid and at least one dihydric phenol in the presence of a catalytic amount of a compound selected from the group consisting of antimony, tin, and titanium compounds and at a temperature sufficient to maintain the resulting polyester in a molten state.

4,093,596

METHOD FOR POLYMERIZATION OF POLYPHENYLENE OXIDES

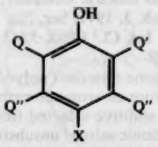
Walter Karl Olander, Clifton, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,501

Int. Cl.[2] C08G *65/44*

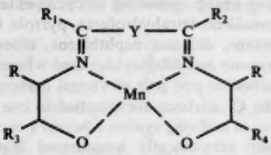
U.S. Cl. 260—47 ET **12 Claims**

1. A method for the preparation of a polyphenylene oxide which comprises oxidatively coupling a phenolic monomer of the formula:



wherein X is a substituent selected from the group consisting of hydrogen, chlorine, bromine and iodine; Q is a monovalent substituent selected from the group consisting of hydrocarbon

radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenol nucleus, hydrocarbonoxy and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; and Q′ is as defined for Q, and in addition may be halogen and Q″ are each as defined for Q′ and in addition hydrogen with the proviso that Q, Q′ and Q″ are all free of a tertiary carbon atom, in the presence of a catalyst of the formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of lower alkyl of from 1 to 8 carbon atoms, aryl and hydrogen; R_1 and R_2 may be concatenated together when Y is a single bond to form a six carbon ring that may be saturated or have up to two double bonds and which may be substituted with a substituent selected from the group consisting of hydrogen, halogen, lower alkyl of from 1 to 8 carbon atoms, lower alkoxy of from 1 to 8 carbon atoms; Y is a single bond or is CH_2, and R is hydrogen or R may be concatenated together with R_3 to form an unsaturated ring containing 5 to 6 carbon atoms or saturated ring containing 5 to 6 carbon atoms which may be unsubstituted or substituted with lower alkyl groups of 1 to 8 carbon atoms or aryl groups, an organic solvent, an alkali and an oxygen containing gas, to form a polyphenylene oxide and thereafter recovering the polyphenylene oxide from the reaction mixture.

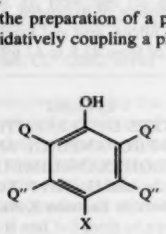
4,093,597

POLYMERIZATION OF 2,6-DI-SUBSTITUTED PHENOLS

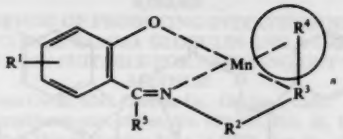
Walter Karl Olander, Clifton, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,506
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET **13 Claims**

1. A method for the preparation of a polyphenylene oxide which comprises oxidatively coupling a phenolic monomer of the formula:



wherein X is substituent selected from the group consisting of hydrogen, chlorine, bromine and iodine; Q is a monovalent substituent selected from the group consisting of hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenol nucleus, hydrocarbonoxy and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; and Q′ is as defined for Q, and in addition may be halogen and Q″ are each as defined for Q′ and in addition hydrogen with the proviso that Q, Q′ and Q″ are all free of a tertiary carbon atom, in the presence of a catalyst of the formula:



wherein R^1 is selected from hydrogen, lower alkyl of from 1 to 8 carbon atoms and phenyl; halogen, lower alkoxy of from 1 to 8 carbon atoms; R^2 is o-phenylene; lower alkoxy o-phenylene wherein the lower alkoxy group has from 1 to 8 carbon atoms; halo-o-phenylene; lower alkyl-o-phenylene wherein the lower alkyl group has from 1 to 8 carbon atoms; lower alkylene of from 2 to 3 carbon atoms; phenyl lower alkylene wherein the alkylene portion has from 2 to 3 carbon atoms and lower alkyl substituted lower alkylene wherein the lower alkyl group has from 1 to 8 carbon atoms and the alkylene portion has from 2 to 3 carbon atoms; R^3 is oxygen or nitrogen; R^4 is lower alkyleneoxy having from 2 to 3 carbon atoms, lower alkyl substituted alkyleneoxy wherein the lower alkyl group has from 1 to 8 carbon atoms and the alkylene portion has from 2 to 3 carbon atoms, o-phenyleneoxy, phenyl lower alkyleneoxy wherein the alkylene group has from 2 to 3 carbon atoms' lower alkyl-o-phenylene wherein the lower alkyl group has from 1 to 8 carbon atoms or phenyl-o-phenyleneoxy; R^5 is selected from hydrogen, lower alkyl of 1 to 8 carbon atoms or phenyl; and n is 0 or 1 an organic solvent, a base, and an oxygen containing gas, to form a polyphenylene oxide and thereafter recovering the polyphenylene oxide from the reaction mixture.

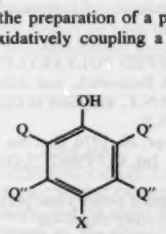
4,093,598

OXIDATIVE COUPLING OF PHENOLIC MONOMERS IN THE PRESENCE OF MANGANESE COMPLEXES OF MANGANESE PHENYL BENZOIN OXIME CATALYSTS

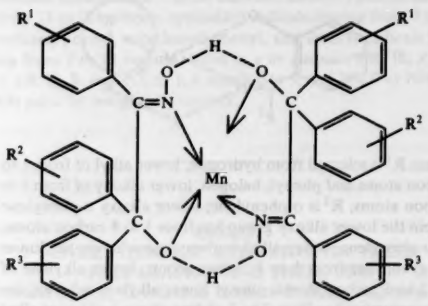
Eugene George Banucci, Scotia, and Walter Karl Olander, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,507
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET **7 Claims**

1. A method for the preparation of a polyphenylene oxide which comprises oxidatively coupling a phenolic monomer having the formula



wherein X is a substituent selected from the group consisting of hydrogen, chlorine, bromine and iodine; Q is a monovalent substituent selected from the group consisting of hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenol nucleus, hydrocarbonoxy and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; and Q′ is as defined for Q, and in addition may be halogen and Q″ are each as defined for Q′ and in addition hydrogen with the proviso that Q, Q′ and Q″ are all free of a tertiary carbon atom in a basic reaction medium in the presence of oxygen and a manganese commplex having the formula



(I)

wherein R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 8 carbon atoms, lower alkenyl of from 1 to 8 carbon atoms, aryl, amino, lower alkoxy of from 1 to 8 carbon atoms and halogen.

4,093,599

PROCESS FOR THE PREPARATION OF VULCANIZABLE ELASTOMERS FROM THIODIETHANOL

Romeo Raymond Aloia, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,115
Int. Cl.[2] C08G *75/12*
U.S. Cl. 260—47 R **15 Claims**

1. A process for the preparation of a thiodiethanol-based elastomer composition which comprises condensing a monomer charge comprising thiodiethanol, or a major proportion of thiodiethanol with (A) one or more saturated or unsaturated aliphatic diols, or (B) one or more dihydric phenolic compounds or (C) mixtures of (A) and (B) at a temperature above about 150° C in the presence of from about 0.1 to 3 percent by weight, based on the weight of said monomer charge, of phosphorous acid, to provide an oligomeric precondensate having a molecular weight in the range of about 500 to 5000, said precondensate being fluid at temperatures above about 100° C; adding to said precondensate from about 0.01 to 0.1 percent by weight, based on the weight of said precondensate, of sulfuric acid and continuing the condensation reaction at a temperature in the range of about 150° C to 220° C until the condensate attains a molecular weight sufficient to provide a Mooney viscosity of at least about 10.

4,093,600

SILANE END-CAPPED POLYARYLENE POLYETHERS

You-Ling Fan, East Brunswick, and Alford Gailey Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,830
Int. Cl.[2] C08G *75/00*
U.S. Cl. 260—49 **17 Claims**

1. A silane end-capped polyarylene polyether of the formula:
X—polyarylene polyether chain—X'
wherein X and X' individually represent silane end groups, wherein each silane end group contains at least one hydrolyzable substituent group or at least one silanol hydroxyl group.

4,093,601

VINYL ESTERS OF TETRACARBOXYLIC ACIDS AND RESINS DERIVED THEREFROM

Erich Kuehn, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Sep. 29, 1976, Ser. No. 727,411
Int. Cl.[2] C08F *218/14, 224/00, 226/06*
U.S. Cl. 260—63 UY **8 Claims**

1. A composition curable to a condensation or addition type copolymer resin comprising one or more ethylenically unsaturated monomers selected from the group consisting of vinyl esters, aryl vinyl compounds, vinyl nitriles and divinyl compounds and a carbocyclic or heterocyclic carboxylic ester monomer useful in imparting heat resistance to vinyl resin copolymers made therefrom having the general formula:

$$(RO_2C')_2{=}X{=}(C''O_2R')_2$$

wherein =X= is selected from a tetravalent 5 or 6 membered single ring system and a double 6 membered ring system selected from the group consisting of cyclopentane, cyclopentene, cyclopentadiene, tetrahydrofuran, pyrrole, benzene, pyridine, cyclohexane, dioxane, naphthalene, dibenzene, benzophenol, anthracene and dibenzylmethane wherein the C' carbons are attached to one pair of vicinal carbons in said ring system and the C'' carbons are attached to one other pair of vicinal carbons in said ring system wherein 1 each of R and R' is a terminally ethylenically unsaturated aliphatic radical linked by the removal of the hydroxyl group from compounds selected from the group consisting of monohydric vinyl alcohol and alkoxylated derivatives thereof and the other of each R and R' is selected from the group consisting of —H, $—CH_2C$-$H(OH)CH_2O_2CCR''{=}CH_2$, and $—CH[CH_2(OH)]CH$-$_2O_2CCR''{=}CH_2$, wherein R'' is —H or $—CH_3$.

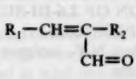
4,093,602

POLYMERIC MATERIAL CONTAINING ALDEHYDE GROUPS AND THE METHOD OF ITS PREPARATION

Jaroslav Kálal; Eva Žurková, both of Prague, and František Švec, Kladno, all of Czechoslovakia, assignors to Ceskoslovanska akademie ved, Prague, Czechoslovakia

Filed Oct. 20, 1975, Ser. No. 623,964
Claims priority, application Czechoslovakia, Oct. 24, 1974, 7282/74
Int. Cl.[2] C08G *2/00, 12/04, 2/26*
U.S. Cl. 260—73 R **4 Claims**

1. Polymeric material which is in the form of spherical particles having a diameter of up to 3 mm, contains up to 40% of free aldehyde groups, and is formed by radical copolymerization of a monomer of the general formula:



I,

where R_1 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aryl and furyl and R_2 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, halogen, nitrile, aryl and furyl, with a crosslinking agent in an amount of from 43.8 to 63.6% on a molar basis.

4,093,603

COPOLYESTERS OF TEREPHTHALIC ACID, 1,2-PROPANEDIOL AND 1,4-CYCLOHEXANEDIMETHANOL

Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1977, Ser. No. 760,778
Int. Cl.[2] C08G *63/18*
U.S. Cl. 260—75 R **3 Claims**

1. A composition comprising a copolyester of Components 1, 2 and 3 as follows:
   1. terephthalic acid or derivatives thereof;
   2. from about 30 to about 75 mole percent of 1,4-cyclohexanedimethanol; and
   3. from 70 to 25 mole percent of 1,2-propanediol; said copolyester having an inherent viscosity of at least about 0.40 as measured at 25° C. using 0.5 gram of polyester per 100 ml. of a solvent consisting of 60% by volume phenol and 40% by volume tetrachloroethane.

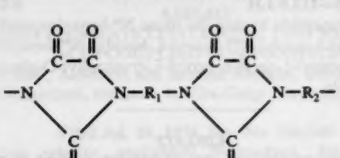
4,093,604

COPOLYMERS OF POLYPARABANIC ACIDS AND POLYAMIDES

Augustin T. Chen, Cheshire, and Kemal B. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

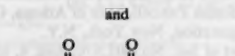
Filed Jul. 5, 1977, Ser. No. 812,800
Int. Cl.[2] C08G *18/00*
U.S. Cl. 260—77.5 CH 7 Claims

1. A copolymer characterized by the presence in random arrangement of each of the following recurring units:



(I)

and



(II)

wherein R_1 represents a member selected from the group consisting of alkylene from 1 to 15 carbon atoms, inclusive, arylene from 6 to 12 carbon atoms, inclusive, and aralkylene from 7 to 25 carbon atoms, inclusive, R_2 is the residue of an organic diisocyanate $R_2—(NCO)_2$, and, in 75 to 100 percent of the units (II), R_3 is alkylene from 4 to 13 carbon atoms, inclusive, and, in 0 to 25 percent of the units (II), R_3 is arylene from 6 to 12 carbon atoms, inclusive, with the proviso that, when R_1 represents arylene, R_3 is free of aromaticity.

4,093,605

AUXILIARY AGENT FOR IMPROVING RETENTION, DRAINAGE AND TREATMENT

Lutz Hoppe; Branislav Boehmer, and Rudolf Behn, all of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Jan. 21, 1976, Ser. No. 650,966
Claims priority, application Germany, Jan. 24, 1975, 2502874; Aug. 30, 1975, 2538745
Int. Cl.[2] C08G *69/48*
U.S. Cl. 260—78 SC 3 Claims

1. An auxiliary agent for improving the retention of flushable solids, for accelerating the drainage of suspensions and for rapid treatment of industrial waters, effluents and sludges by adding thereto basic water soluble polymer consisting essentially of a reaction product C formed by crosslinking 0.5 to 3 mols of an intermediate product A with 0.8 – 1.2 mols of an intermediate product B and 1–3 mols of a polyfunctional compound selected from the group consisting of epichlorohydrin and dihalogenoalkane, product A being at least one polyamine which contains quaternary nitrogen and formed at 40°–100° C by the action of 1–2 mols of a material selected from the group consisting of at least one polyvalent amine, at least one monovalent amine and mixture thereof with the reaction product of one mol of a secondary amine hydrochloride with 1 to 3 mols of epichlorohydrin, product B being at least one resinous, basic polyamino-amide formed from reacting materials selected from the group consisting of; at least one dicarboxylic acid and at least one polyalkylene polyamine; at least one aminocarboxylic acid and hexamethylenediammonium adipate; and at least one lactam and hexamethylene diammonium adipate.

4,093,606

METHOD OF PRODUCING INTRAVENOUSLY INJECTABLE GAMMA GLOBULIN AND A GAMMA GLOBULIN SUITABLE FOR CARRYING OUT THE METHOD

Myer Louis Coval, 6241 Chelton Dr., Oakland, Calif.

Continuation-in-part of Ser. No. 550,467, Feb. 18, 1975, abandoned. This application May 21, 1976, Ser. No. 688,621
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 6 Claims

1. A process for preparing a gamma globulin substantially devoid of anticomplementary activity and suitable for intravenous administration, from a material selected from the Fraction II + III plasma protein paste having a protein content of about 25–30% and Fraction II paste which comprises the steps:

a. suspending said paste in water to form a solution of low ionic strength having a conductance of about 300×10^{-6} cm^{-6} ohm^{-1} at a pH of about 4.8 to 6.5 to produce a precipitate and filtrate,

b. fractionally precipitating impurities from said filtrate by adding polyethylene glycol to 4% weight/volume and then 5% weight/volume,

c. precipitating the gamma globulin by adding polyethylene glycol to 12% weight/volume at a pH of about 8.0.

said process being carried out at a temperature of about 0° to 20 ° C.

4,093,607

IMMUNOLOGIC CHEMOTHERAPEUTIC AGENTS COMPRISING ANTIGEN BINDING DIMERS COVALENTLY BOUND TO DRUGS

Michael Sela; Ruth Arnon, both of Rehovot; Ruth Maron, Tel Aviv, all of Israel, and Esther Hurvitz, Potomac, Md., assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed May 25, 1976, Ser. No. 689,276
Claims priority, application Israel, May 27, 1975, 47372
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—112 B 17 Claims

1. A composition of matter comprising an antigen binding dimer containing an anti-tumor antibody specific to a tumor antigen, said dimer covalently bonded to an anti-cancer drug through a functional group on the dimer that is nonessential for antibody activity of the dimer, and through a functional group on the drug that is nonessential for the pharmacological activity of the drug, thereby preserving both the antibody activity of the dimer and the pharmacological activity of the drug.

4,093,608

PROCESS FOR PURIFYING COAGULATION FACTOR VIII USING DEAE-CROSSLINKED DEXTRAN

Yoshiro Iga, Nishinomiya, and Masashi Shiga, Nagaokakyo, both of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Apr. 1, 1977, Ser. No. 783,625
Claims priority, application Japan, Apr. 9, 1976, 51-39894
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—112 B 1 Claim

1. A process for purifying coagulation factor VIII which comprises contacting for 10 to 60 minutes a human plasma or plasma fraction containing both prothrombin complex and factor VIII, said plasma or plasma fraction having an electroconductivity in the range of 7,000 to 12,000 μ Ω/cm, a pH of 6.8 to 7.9, and a liquid temperature of 0° to 10° C, with diethylaminoethyl cross-linked dextran and thereby adsorbing and removing said prothrombin complex.

4,093,609

SOMATOSTATIN SYNTHESIS

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,499
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 S 3 Claims

1. In a solution phase synthesis of somatostatin wherein successive amino acid residues are coupled N-terminally to a preceding peptide fragment followed ultimately by complete deprotection of the tetradecapeptide and oxidation to produce the 3–14 disulfide bond, the improvement which comprises:

(a) preforming by solid phase synthesis the compound (R)Phe-Phe-Trp-Lys(R)-Thr(R)-Phe-Thr(R)-Ser(R)-O-Resin

(b) removing the fully protected octapeptide from the Resin by reaction with hydrazine;

(c) coupling the octapeptide hydrazide with Cys(R)(OR) by the azide method and subsequently

(d) completing the N-terminal elongation of the peptide chain by the solution method.

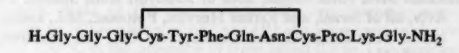
4,093,610

PROCESS FOR PRODUCING TRIGLYCYL-LYSINE VASOPRESSIN AND INTERMEDIATES THEREFOR

Nedumparambil A. Abraham, Dollard des Ormeaux; Hans U. Immer, Mount Royal, and Kazimir Sestanj, Point Claire, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 763,772
Int. Cl.[2] C07C *103/52*; C07G *7/00*; C09H *00/00*
U.S. Cl. 260—112.5 R 12 Claims

1. A process for preparing a cyclic dodecapeptide of the formula



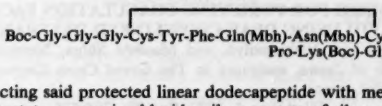
which comprises the steps of:

reacting first hexapeptide of formula Boc—Gly—Gly—Gly—Cys(Trt)—Tyr—Phe—$NHNH_2$ with a reagent which furnishes nitrous acid in situ in the presence of a mineral acid to convert said first hexapeptide to the corresponding first hexapeptide azide and reacting said azide with a second hexapeptide of formula H—Gln(Mbh)—Asn(Mbh)—Cys(Trt)—Pro—Lys(Boc)—Gly—NH_2—

oxidizing the resulting protected linear dodecapeptide of the formula:

Boc—Gly—Gly—Gly—Cys(Trt)—Tyr—Phe—Gln(Mbh)—Asn(Mbh)—Cys(Trt)—Pro—Lys(Boc)—Tly—NH_2

with iodine or thiocyanogen to obtain the protected cyclic disulfide dodecapeptide of the formula



reacting said protected linear dodecapeptide with mercuric acetate, mercuric chloride, silver acetate of silver nitrate to obtain the corresponding mercuric or disilver salt of the corresponding disulfhydryl derivative,

reacting said salt with hydrogen sulfide to obtain the protected linear disulfhydryl dodecapeptide,

oxidizing said last-named dodecapeptide with oxygen, 1,2-diiodoethane, sodium or potassium ferricyanide, iodine or thiocyanogen to obtain said protected cyclic disulfide dodecapeptide;] and

deprotecting said protected cyclic disulfide dodecapeptide in the presence of a concentrated organic acid or an aqueous solution of a mineral acid under moderately acidic conditions appropriate to remove the Boc and Mbh protecting groups to obtain said cyclic dodecapeptide.

4,093,611

OCTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Francis John Tinney, Ann Arbor, Mich., assignor to Parke, David & Company, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,384
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 LH 6 Claims

1. An octapeptide having the name N^{α}-benzyloxycarbonyl-L-glutaminyl-L-prolyl-N^{im}-benzyl-L-histidyl-N^{im}-benzyl-L-histidyl-O-benzyl-L-seryl-L-prolyl-L-tryptophyl-D-alanine N-ethylamide.

4,093,612

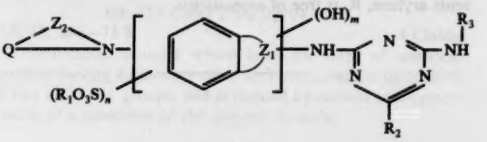
SELECTIVE REMOVAL OF ALBUMIN FROM BLOOD FLUIDS AND COMPOSITIONS THEREFORE

James Travis, and Ralph Pannell, both of Athens, Ga., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 601,676, Aug. 4, 1975, Pat. No. 4,016,149, which is a continuation-in-part of Ser. No. 396,036, Sep. 10, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 661,890
Int. Cl.[2] A23J *1/00*; C07G *7/00*
U.S. Cl. 260—122 19 Claims

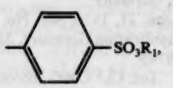
1. A method of obtaining albumin from substantially cell free aqueous fluids containing the same comprising the steps of

a. suspending a composition of the general formula $(SP)_x(CRD)$ wherein CRD is a color reactive dye of the general formula



wherein

R_3 is hydrogen, alkyl, phenyl, alkoxy phenyl, alkyl phenyl or



wherein R_1 is hydrogen, an alkali metal, or an alkaline earth metal, R_2 is halo or —O—dextran,

Z_1 is two hydrogen atoms, or —CH=CH—CH=CH— to form a naphthyl nucleus with the phenyl nucleus to which it is attached,

Z_2 is one bond of a nitrogen-nitrogen bond or a hydrogen attached to the nitrogen shown only,

Q is substituted or unsubstituted aryl where Z_2 is hydrogen, or Q is substituted or unsubstituted aryl-N= where Z_2 is one bond of a double bond,

m is 1 or 0, *n* is 1 or 2, provided that the substituent groups aforesaid are other than halo or heavy metal, and wherein SP is a solid support phase selected from the group consisting of agarose, polyacrylamide and acrylic resin containing amino groups, provided that where the CRD, R_2 is halo, the SP- linkage in the $(SP)_x(CRD)$ is to the R_2 bearing position of the triazine moiety, and where in the CRD R_2 is O-dextran, the SP- linkage in the $(SP)_x(CRD)$ is to the Q moiety,

and *x* is expressed as a weight ratio between 0.8 and 40,

in a buffer of at least 0.05 M molarity at a pH of between 6.5 and 8.5;

b. contacting said suspension with said albumin containing fluid to provide a suspension having albumin absorbed upon the solid phase thereof;

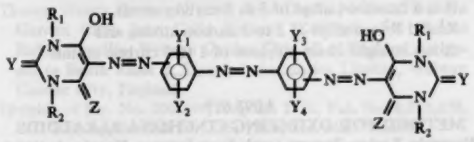
c. separating the solid phase-albumin adsorbate from the aqueous phase by treating the solid phase-albumin adsorbate with an aqueous ionic eluent wherein the anion is thiocyanate.

4,093,613
TRISAZO PIGMENTS CONTAINING TWO BARBITURIC ACID COUPLING COMPONENTS

Stefan Hari, Allschwil, and Armand Rouèche, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,369
Claims priority, application Switzerland, Jul. 31, 1975, 10000/75
Int. Cl.² C09B *35/00*
U.S. Cl. 260—154 **8 Claims**

1. An azo pigment of the formula



in which R_1 and R_2 denote H, alkyl with 1–6 C atoms or aryl, Y denotes an O, S or imino, Z denotes O or imino and Y_1–Y_4 denote H, halogen, alkyl containing 1–4 C atoms, alkoxy containing 1–4 C atoms, nitro, trifluoromethyl or alkoxycarbonyl containing 2–4 C atoms.

4,093,614
METAL COMPLEXES OF NITROGEN COMPOUNDS

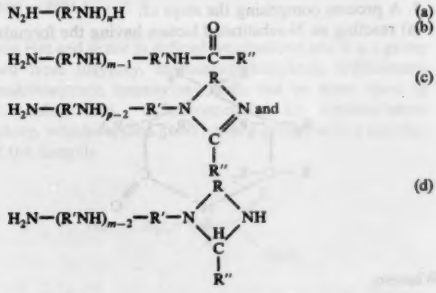
Sheldon Chibnik, Cherry Hill, and Ferdinand P. Otto, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 493,358, Jul. 31, 1974, Pat. No. 3,945,933. This application Dec. 9, 1975, Ser. No. 639,026
Int. Cl.² C07F *3/06*; C10L *1/30*; C10M *1/54*
U.S. Cl. 260—299 **15 Claims**

1. A double complex salt product which is a complex of a coordinated complex of the Werner type, said double complex salt product consisting essentially of the reaction product of

(1) an alkenyl succinic anhydride in which the alkenyl group contains from 8 to about 500 carbon atoms,

(2) a member selected from the group consisting of



(a) (b) (c) (d)

wherein *n* is a number from 1 to 10, *m* is a number from 2 to 10, *p* is a number from 3 to 10, R′ is alkylene of 2 to 5 carbon atoms and R″ is hydrogen or a hydrocarbyl group of 1 to 30 carbon atoms,

(3) a first metal compound consisting essentially of a metal of Periodic Groups IB, IIB, IVA, IVB, VB VIB, VIIB, or VIII which forms a complex with reactant (2) and

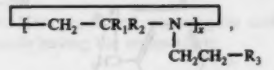
(4) a second metal compound, different from (3), selected from the group consisting of (3), and alkali and alkaline earth metal oxides, hydroxides, halides and carboxylates of monocarboxylic acids having from 1 to 30 carbon atoms.

4,093,615
CYCLIC OLIGOMERS OF N-SUBSTITUTED AZIRIDINES

George E. Ham, Lake Jackson, and Ruben L. Krause, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 180,236, Sep. 13, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,049
Int. Cl.² C07D *255/02, 257/02, 259/00*
U.S. Cl. 260—239 BC **11 Claims**

1. A cyclic oligomer of the formula

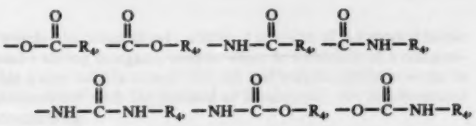


wherein

(a) *x* is an integer of from 3 to 8;

(b) R_1 and R_2 are independently hydrogen or lower alkyl; and

(c) R_3 is hydrogen, hydroxyl, cyano, a hydrocarbyl radical R_4 selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and alkenyl, the corresponding hydroxy-substituted R_4 hydrocarbyl radical or R_3 is represented by one of the formulas



and —O—R_4, wherein each hydrocarbyl radical R_4 has from 1 to 24 carbon atoms.

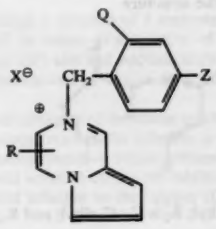
4,093,616
QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, which is a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,442
Int. Cl.² C07D *215/10, 241/38, 401/04*; A61K *31/495*
U.S. Cl. 544—344 **11 Claims**

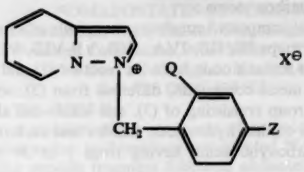
1. A compound selected from those having the formulae:

III

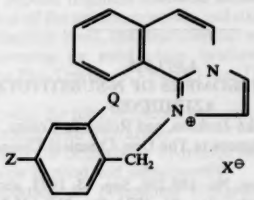


-continued

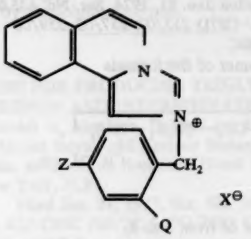
IV



V



VI



wherein R is hydrogen or the carbon and hydrogen atoms completing a fused 3,4-benzo moiety; Q and Z are each selected from the group consisting of hydrogen and chlorine; and X is a pharmaceutically acceptable anion.

4,093,617

3,5,7-TRISUBSTITUTED PYRAZOLO[1,5-a]PYRIMIDINES

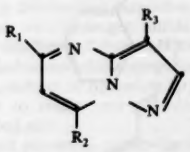
Roland K. Robins, Santa Ana; Darrell E. O'Brien, Mission Viejo, and Thomas Novinson, Costa Mesa, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation of Ser. No. 520,731, Nov. 12, 1974, abandoned, which is a continuation of Ser. No. 273,465, Jul. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 206,538, Dec. 9, 1971, abandoned. This application Jan. 28, 1976, Ser. No. 653,013

Int. Cl.² C07D *487/04;* A61K *31/415*

U.S. Cl. 544—281 **8 Claims**

1. A compound of the structure



wherein R_1 is C_1–C_3 alkyl; R_2 is C_1–C_3alkyl; and R_3 is halogen.

4,093,618

AMIDES OF 2,4,6-TRIALKYL-3-HYDROXY-PHENYLALKANOIC ACIDS

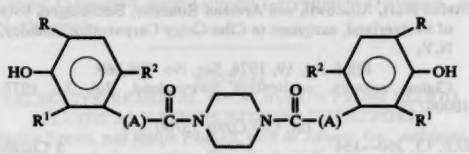
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 494,156, Aug. 2, 1974, Pat. No. 3,988,363, which is a continuation-in-part of Ser. No. 400,603, Sep. 25, 1973, abandoned. This application Jun. 7, 1976, Ser. No. 693,387

Int. Cl.² C07D *295/18*

U.S. Cl. 544—387 **4 Claims**

1. A compound having the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms, and

A is a straight chain alkylene of 1 to 3 carbon atoms.

4,093,619

METHOD FOR OXIDIZING CINCHONA ALKALOIDS

Francois Xavier Jarreau, and Jean-Jacques Koenig, both of Paris, France, assignors to Etablissements Nativelle S.A., Paris, France

Filed Nov. 19, 1976, Ser. No. 743,257

Claims priority, application France, Nov. 19, 1975, 75 35383

Int. Cl.² C07D *401/06;* C07G *5/00*

U.S. Cl. 260—284 **13 Claims**

1. A method of oxidizing cinchona alkaloids comprising the step of reacting a ketone represented by the formula: R_3COR_4 in which R_3 and R_4 are the same or different and denote a branched alkyl group, an aryl group or R_3 and R_4 together with the carbonyl group form a condensed ring or a carbon or heterocyclic ring having 5 to 7 atoms with a cinchona alkaloid in the presence of a strong base in an aprotic solvent.

4,093,620

PROCESS FOR PRODUCING 2-CYANO N-SUBSTITUTED HETEROCYCLIC COMPOUNDS AND PRODUCTS PRODUCED THEREBY

Thomas S. Osdene, and Edward B. Sanders, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

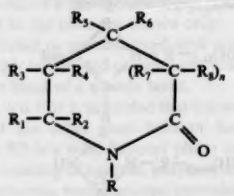
Filed Jun. 10, 1976, Ser. No. 694,687

Int. Cl.² C07D *213/57, 401/04*

U.S. Cl. 260—291 **10 Claims**

1. A process comprising the steps of:

(a) reacting an N-substituted lactam having the formula:



Wherein:

n is 0 to 1;

R is methyl or phenyl; R_1 is H or pyridyl; and each of R_2 through R_8 is H

with a reducing agent selected from the group consisting of sodium aluminum hydride, sodium bis-(methoxyethoxy)aluminum hydride and di-isobutylaluminum hydride at a temperature below about 20° C for at least 30 minutes under an inert atmosphere to produce an intermediate and

(b) then reacting said intermediate with a reagent comprising an alkali metal cyanide at a temperature from about 0° to about 30° C for at least 15 minutes.

4,093,621

PROCESS FOR PREPARING HETEROCYCLICALKYLTHIOALKYL-N-CYANOGUANIDINES AND THIOUREAS

Thomas Henry Brown; Graham John Durant, both of Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

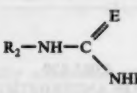
Division of Ser. No. 606,269, Aug. 20, 1975, Pat. No. 4,013,678. This application Nov. 15, 1976, Ser. No. 741,586

Claims priority, application United Kingdom, Sep. 2, 1974, 38257/74

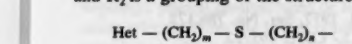
Int. Cl.² C07D *213/44, 233/30*

U.S. Cl. 260—294.8 H **8 Claims**

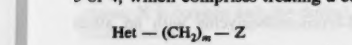
1. A process for the production of a compound of the formula:



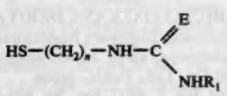
wherein E is sulphur or NCN, R_1 is hydrogen or lower alkyl, and R_2 is a grouping of the structure



wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from imidazole, pyridine, thiazole, isothiazole, oxazole, triazole or thiadiazole which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; and *m* is 1 or 2, and *n* is 2 or 3 such that the sum of *m* and *n* is 3 or 4; which comprises treating a compound of the formula



wherein Het and *m* are as defined hereinabove and Z is a group selected from tosyloxy, methanesulphonyloxy, trifluoromethanesulphonyloxy, benzoyloxy with one or more nitro or chloro substituents, trifluoroacetoxy or diphenylphosphoryloxy, which forms a good leaving group, with a mercaptan of the formula



wherein *n*, E and R_1 are as defined hereinabove, in the presence of a base, said reactants and base being present in molar equivalent amounts.

4,093,622

PYRIDINE ESTERS OF CYCLOPROPANE-CARBOXYLIC ACID

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 578,837, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 418,595, Nov. 23, 1973, abandoned. This application Jul. 26, 1976, Ser. No. 708,825

Int. Cl.² C07D *213/51*

U.S. Cl. 260—295 R **2 Claims**

1. The compound, bis(cyclopropanemethyl)2,6-pyridinedicarboxylate.

2. The compound, bis(cyclopropanemethyl)2,5-pyridinedicarboxylate.

4,093,623

METHOD OF PREPARING THE ACID COPPER SALT OF 5-NITROTETRAZOLE

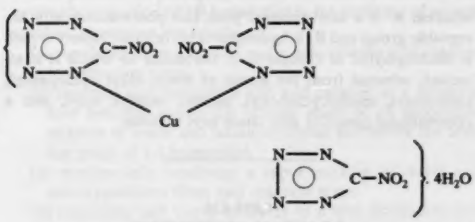
William H. Gilligan, Washington, D.C., and Mortimer J. Kamlet, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,197

Int. Cl.² C07F *1/08*

U.S. Cl. 260—299 **12 Claims**

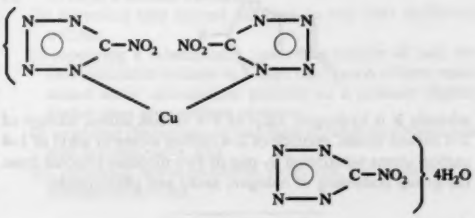
1. In the Von Herz process of preparing the acid copper salt of 5-nitrotetrazole having the composition



which comprises slowly adding a solution of 5-aminotetrazole and a strong inorganic acid in water to a solution of a compatible water soluble copper (II) salt and sodium nitrite in water in accordance with the method of Sandmeyer, the improvement comprising:

using a 25 to 100 percent excess of $NaNO_2$.

3. In the Von Herz process of preparing the acid copper salt of 5-nitrotetrazole having the composition



by slowly adding a solution of 5-aminotetrazole and a strong inorganic acid in water to a solution of a compatible water soluble copper (II) salt and sodium nitrite in water in accordance with the method of Sandmeyer, the improvement comprising:

adding small amounts of the water soluble copper (II) salt to the 5-aminotetrazole-acid solution to prevent the build up of detonation sensitive 5-diazotetrazole in the 5-aminotetrazole-acid solution during the addition of the 5-aminotetrazole-acid solution to the copper (II) salt-sodium nitrite solution.

4,093,624

1,2,4-THIADIAZOLIDINE-3,5-DIONE

Ganapathi R. Revankar, and Roland K. Robins, both of Santa Ana, Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Jan. 31, 1977, Ser. No. 763,913
Int. Cl.[2] C07D *285/08*
U.S. Cl. 260—302 D 1 Claim

1. The compound 1,2,4-Thiadiazolidine-3,5-dione.

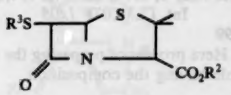
4,093,625

6-SULFUR ANALOGS OF PENICILLINS AND CEPHALOSPORINS

Thomas J. Commons, Boston; John C. Sheehan, Lexington, and Young-Sek Lo, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 9, 1976, Ser. No. 712,540
Int. Cl.[2] C07D *499/00, 501/00, 501/04, 501/10*
U.S. Cl. 260—306.7 C 18 Claims

1. A compound having the formula:



wherein R^2 is a conventional penicillin pharmaceutically acceptable group and R^3 is hydrogen or an organic moiety which is electrophyllic as compared to the sulfur to which it is attached, selected from the group of lower alkyl cyclopentyl, cyclohexyl, methycyclohexyl, phenyl, benzyl, tolyl, and a conventional pencillin side chain acyl radicals.

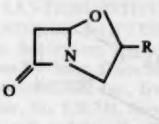
4,093,626

β-LACTAM ANTIBIOTICS

Eric Hunt, Reigate, England, assignor to Beecham Group Limited, United Kingdom

Filed Dec. 20, 1976, Ser. No. 752,002
Claims priority, application United Kingdom, Jan. 27, 1976, 02976/76
Int. Cl.[2] C07D *498/04*
U.S. Cl. 260—307 FA 5 Claims

1. A compound of the formula (I):



(I)

wherein R is hydrogen, alkyl of 1–4 carbon atoms, alkenyl of 2–4 carbon atoms, epoxide of 2–4 carbon atoms or alkyl of 1–4 carbon atoms substituted by one or two moieties selected from the group consisting of halogen, azido and phthalimido.

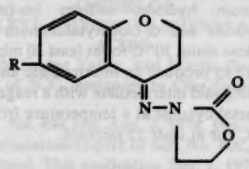
4,093,627

3-[(4-CHROMANYLIDENE)AMINO]-2-OXAZOLIDINONES

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,126
Int. Cl.[2] C07D *263/26*
U.S. Cl. 260—307 C 4 Claims

1. A compound of the formula:



wherein R is hydrogen, methoxy or nitro.

4,093,628

THIOPHENE ETHANOLAMINES

Jehan F. Bagli, Kirkland, and Eckhardt Ferdinandi, St. Laurent, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 569,509, Apr. 18, 1975, Pat. No. 4,024,156.
This application Feb. 15, 1977, Ser. No. 768,913
Claims priority, application Canada, Apr. 18, 1974, 197896
Int. Cl.[2] C07D *333/20, 333/28, 405/12, 409/12*
U.S. Cl. 260—326.12 R 5 Claims

1. A compound of the formula

$ArCHOR^1CHR^2NR^3R^4$

in which Ar is selected from the group consisting of 2-thienyl, 5-(lower alkyl)-2-thienyl, 5-phenyl-2-thienyl and 4,5-dichloro-2-thienyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 is hydrogen or lower alkyl; and R^4 is 2-indol-3-ylethyl, and the acid addition salts thereof with pharmaceutically acceptable acids.

4,093,629

DERIVATIVES OF ANTIBIOTIC SUBSTANCE MILBEMYCIN AND PROCESSES THEREFOR

Michael H. Fisher, Bridgewater, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 11, 1977, Ser. No. 786,172
Int. Cl.[2] C07D *493/22*
U.S. Cl. 260—326.34 4 Claims

1. 13-Hydroxy milbemycin A_1, A_2, A_3, A_4, B_1, B_2, B_3, C_1 or C_2.

4. A process for the preparation of 13-hydroxy milbemycins A_1, A_2, A_3, A_4, B_1, B_2, B_3, C_1 or C_2 which comprises:

(a) brominating the 13-unsubstituted milbemycins with N-bromosuccinimide;

(b) acetylating the 13-bromomilbemycins with an alkali metal acetate; and

(c) hydrolizing the 13-acetoxy milbemycins with aqueous alkali metal hydroxide.

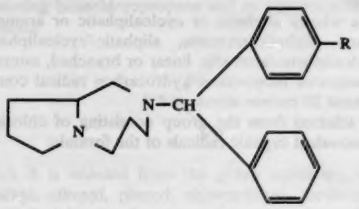
4,093,630

DIAZABICYCLOALKANE DERIVATIVES

Hideo Kato, Katsuyama; Tomoyasu Nishikawa, Ono, and Eiichi Koshinaka, Katsuyama, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Fukui, Japan

Filed Jun. 8, 1977, Ser. No. 804,591
Claims priority, application Japan, Jun. 10, 1976, 51-67158
Int. Cl.[2] C07D *487/08*
U.S. Cl. 260—326.85 5 Claims

1. A diazabicycloalkane compound of the formula:



wherein R represents a hydrogen atom or a halogen atom selected from the group consisting of chlorine, bromine and iodine, and therapeutically acceptable acid addition salts thereof.

4,093,631

7-AMINOPROPOXY CHROMANE AND CHROMENES

Derek Victor Gardner, Bishop Stortford, England, assignor to Beecham Group Limited, United Kingdom

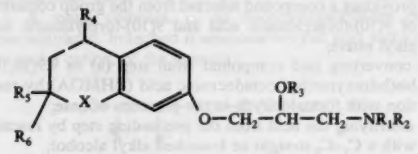
Filed Jun. 1, 1976, Ser. No. 691,865

Claims priority, application United Kingdom, Jun. 3, 1975, 24005/75

Int. Cl.[2] C07D *311/02;* A61K *31/35*

U.S. Cl. 260—345.2 **45 Claims**

1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof wherein R_1 is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl; R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl; R_3 is hydrogen, alkyl 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms; R_4 is naphthyl, phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, methoxyl, benzyloxyl, trifluoromethyl, methyl, cyano, nitro, acetoxyl, amino, methylamino, ethylamino, dimethylamino, diethylamino, acetamido, hydroxyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, sulphonamido, carboxy, trifluoromethylthio, trifluoromethoxyl, methylsulphonyl, trifluoromethylsulphonyl and methylthio; R_5 is hydrogen or alkyl of 1 to 4 carbon atoms; R_6 is hydrogen or alkyl of 1 to 4 carbon atoms; X is oxygen and the dotted line represents a single or double bond.

4,093,632

6(6-SUBSTITUTED-2,5,7,8-TETRAMETHYL-2-CHROMANYL)-3-METHYL HEXANOL DERIVATIVES

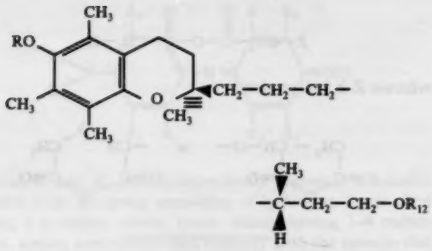
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,382, Dec. 8, 1975, Pat. No. 4,029,678, which is a continuation-in-part of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Feb. 22, 1977, Ser. No. 770,542

Int. Cl.[2] C07D *311/72*

U.S. Cl. 260—345.5 **2 Claims**

1. A compound of the formula



wherein R is lower alkanoyl, benzyl, benzhydryl or trityl; R_{12} is hydrogen or taken together with its attached oxygen atom forms a leaving group.

4,093,633

PROCESS FOR PREPARING TETRAHYDROFURAN

Yasuo Tanabe; Jun Toriya; Masato Sato, and Ken Shiraga, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,506

Claims priority, application Japan, Feb. 4, 1976, 51-11078

Int. Cl.[2] C07D *307/08*

U.S. Cl. 260—346.11 **10 Claims**

1. A process for preparing tetrahydrofuran by the dehydrocyclization reaction of 1,4-butanediol in the presence of an acid catalyst, consisting essentially of;

(a) supplying 1,4-butanediol and a non-volatile acid catalyst to a reaction zone,

(b) reacting said butanediol and said catalyst at a temperature between above the boiling point of an azeotropic mixture of water and tetrahydrofuran and below the boiling point of 1,4-butanediol,

(c) continuously removing a vapor mixture of water and tetrahydrofuran from said reaction zone,

(d) supplying said vapor mixtures to a first distillation column maintained under a pressure lower than that in said reaction zone and in the range of from atmospheric pressure to 3 kg/cm^2 gauge,

(e) distilling a first azeotropic mixture of water and tetrahydrofuran to form a first distillate,

(f) supplying said first distillate to a second distillation column maintained under a pressure higher than that in said first distillation column by 3 to 20 kg/cm^2 gauge,

(g) distilling a second azeotropic mixture of water and tetrahydrofuran from the top of said second distillation column to form a second distillate,

(h) recycling said second distillate to said first distillation column,

(i) supplying a substantially water-free-bottom of said second distillation column to a third distillation column maintained under atmospheric pressure or a pressure slightly higher than atmospheric pressure,

(j) recycling the bottom of said third distillation column into said reaction zone, and

(k) obtaining tetrahydrofuran from the top of said third distillation column.

4,093,634

ANHYDRIDES OF CARBOXYMETHYLOXYSUCCINIC ACID

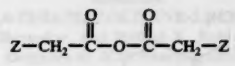
Vincent Lamberti, Upper Saddle River, and Eddie Nelson Gutierrez, Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,226

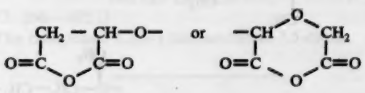
Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.74 **1 Claim**

1. A mixture of carboxymethyloxysuccinic anhydrides consisting essentially of species of the formulae:



wherein Z is independently



4,093,635

PREPARATION OF MALEIC ANHYDRIDE FROM FOUR-CARBON HYDROCARBONS

Noel J. Bremer, Kent; James F. White, Akron, and Ernest C. Milberger, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,740
Int. Cl.² C07D 307/60
U.S. Cl. 260—346.75 **9 Claims**

1. In a process for the preparation of maleic anhydride by the oxidation of n-butane, n-butenes, 1,3-butadiene or mixture thereof with molecular oxygen in the vapor phase at a reaction temperature of about 250° C to 600° C in the presence of a catalyst, the improvement comprising using as a catalyst a catalyst which is free of iron, cobalt, nickel, an alkali metal and an alkaline earth metal, said catalyst having the formula

$$Mo_{12}P_aBi_bCu_cCl_dO_f$$

wherein

a, *b* and *c* are numbers from 0.001–10;

d is from 0.001–5;

and *f* is a positive number of oxygens required to satisfy the valence states of the other elements present.

9. In a process for the preparation of maleic anhydride by the oxidation of 1,3-butadiene with molecular oxygen in the vapor phase at a reaction temperature of about 250° C to 600° C in the presence of a catalyst, the improvement comprising using as a catalyst a catalyst which is free of iron, cobalt, nickel, an alkali metal and an alkaline earth metal, said catalyst having the formula

$$Mo_{12}P_aBi_bCu_cX_dO_f$$

wherein

X is a halogen selected from the group consisting of chlorine, bromine or iodine; and

wherein

a, *b* and *c* are numbers from 0.001–10;

d is from 0.001–5;

and *f* is a positive number of oxygens required to satisfy the valence states of the other elements present.

4,093,636

EPOXIDATION OF OLEFINIC COMPOUNDS

Pierre-Etienne Bost, Thiais, and Michel Costantini, Lyons, both of France, assignors to Rhone - Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 479,262, Jun. 13, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,630
Claims priority, application France, Jun. 14, 1973, 73 21666
Int. Cl.² C07D 301/20
U.S. Cl. 260—348.29 **53 Claims**

1. Process for the catalytic epoxidation of an olefinic compound in the liquid phase which comprises treating the compound with an organic hydroperoxide in the liquid phase in the presence of a tin catalyst of the formula:

$$RR'SnCl_2 \qquad (I)$$

in which:

R is a wholly aliphatic or cycloaliphatic or aromatic, or mixed aliphatic/aromatic, aliphatic/cycloaliphatic or cycloaliphatic/aromatic, linear or branched, saturated or unsaturated monovalent hydrocarbon radical containing at most 20 carbon atoms, and

R′ is selected from the group consisting of chlorine and monovalent organic radicals of the formula:

$$R'' - Y \qquad (II)$$

in which:

Y represents an oxygen atom, or a (—O—O—) group, or a carbonyloxy group (—CO—O—), the radical R″ being attached to the carbon atom of (—CO—O—),

R″ is as defined under R and may be identical or different to R.

4,093,637

ALKYL 9,9(10,10)-BIS(ACYLOXYMETHYL)OCTADECANOATES AS PRIMARY PLASTICIZERS FOR POLYVINYLCHLORIDE

William R. Miller, and Everett H. Pryde, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,113
Int. Cl.² C09F 5/00
U.S. Cl. 260—405 **14 Claims**

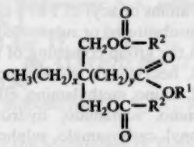
1. A method of preparing a primary plasticizer for polyvinylchloride comprising the following steps:

a. providing a compound selected from the group consisting of 9(10)-formylstearic acid and 9(10)-formylstearic acid alkyl esters;

b. converting said compound from step (a) to 9,9(10,10)-bis(hdroxymethyl)octadecanoic acid (BHMOA) by reaction with formaldehyde in the presence of base;

c. esterifying the acid from the preceeding step by reaction with a C_1–C_8 straight or branched alkyl alcohol;

d. acylating the ester from the preceeding step with a suitable acylating agent to yield the primary plasticizers having the general structure:



where

R^1 = C_1–C_8 Straight or branched alkyl;

R^2 = C_1–C_4 straight or branched alkyl or halogen-substituted alkyl;

x = 7 or 8; and

y = 7 or 8 with the proviso that $x + y = 15$; and

e. recovering said primary plasticizers prepared in step (d).

4,093,638

SIMULTANEOUS PREPARATION OF ORGANIC ACID CHLORIDES AND TRICHLOROACRYLOYL CHLORIDE AND PRODUCT

Francois Muller, Saint-Auban, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, France

Continuation of Ser. No. 764,944, Oct. 3, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,114
Claims priority, application France, Oct. 23, 1967, 67.125439
Int. Cl.² C09F 7/00; C11C 3/00
U.S. Cl. 260—408 **17 Claims**

1. A process for the simultaneous preparation of organic acid

chlorides and trichloroacryloyl chloride comprising the steps of contacting hexachloropropene and an organic acid having the formula

in which R is selected from the group consisting of alkyl, chloroalkyl, alkenyl, phenyl, chlorophenyl, methoxyphenyl and cycloalkyl, heating the mixture to a temperature within the range of 50° to 220° C, and separating the trichloroalkylolyl chloride and the organic acid chlorides produced.

12. The process as claimed in claim 1 in which the organic acid component is selected from the group consisting of butyryl chloride, caproyl chloride, capryloyl chloride, lauroyl chloride, benzoyl chloride, p-chlorobenzoyl chloride and anisoyl chloride.

4,093,639

METAL SALTS OF N-HYDROXYALKYLATED OR N-AMINOALKYLATED BRANCHED α-AMINOACIDS

Jürgen Habermeier, Pfeffingen, Switzerland, and Godwin Berner, Furth, Odenwald, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

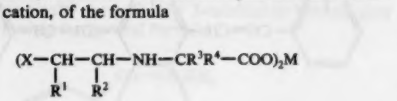
Filed Apr. 2, 1976, Ser. No. 673,238

Claims priority, application Switzerland, Apr. 14, 1975, 4719/75

Int. Cl.² C07F 3/06

U.S. Cl. 260—429.9 **11 Claims**

1. A metal complex, of an N-hydroxyalkylated or N-aminoalkylated, branched α-aminocarboxylic acid and a divalent metal cation, of the formula



wherein

X represents hydroxyl or aminomethyl,

R^1 represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

R^2 represents hydrogen, and with the proviso that when R^1 is alkyl of 1 to 4 carbon atoms or phenyl, R^2 also represents alkyl of 1 to 4 carbon atoms, or

R^1 and R^2 together represent tetramethylene,

R^3 and R^4 are the same or different and each independently represents alkyl of 1 to 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, phenyl or benzyl, or said phenyl or said benzyl substituted by alkyl of 1 to 12 carbon atoms, or together R^3 and R^4 represent tetramethylene or pentamethylene, and

M represents a divalent copper, zinc, cobalt or nickel cation.

4,093,640

DOUBLE SALT OF ZINC CHLORIDE AND INDAMINES

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

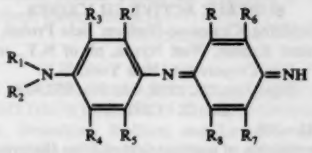
Division of Ser. No. 553,067, Feb. 25, 1975, Pat. No. 3,984,443, which is a division of Ser. No. 387,613, Aug. 13, 1973, Pat. No. 3,876,368, and a continuation-in-part of Ser. No. 180,455, Sep. 14, 1971, abandoned. This application Jun. 23, 1976, Ser. No. 699,207

Claims priority, application France, Sep. 18, 1970, 70.34041

Int. Cl.² C07F 3/06

U.S. Cl. 260—429.9 **1 Claim**

1. A double salt of zinc chloride and an indamine having the formula



wherein R and R′ each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, amino, acetylamino and hydroxy with the proviso that one, but not both of R and R′ is said amino, acetylamino or hydroxy; R_1 and R_2 each independently represent a member selected from the group consisting of lower alkyl having 1–4 carbon atoms and lower alkyl having 1–4 carbon atoms and substituted with a member selected from the group consisting of hydroxy, acetylamino, carbamyl, benzoylamino and alkyl sulfonamido wherein the alkyl moiety has 1–4 carbon atoms, and

R_3, R_4, R_5, R_6, R_7 and R_8 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1–4 carbon atoms.

4,093,641

PREPARATION OF SILYLALKYL ESTERS OF PHOSPHORUS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 26, 1977, Ser. No. 836,451

Int. Cl.² C07F 7/08

U.S. Cl. 260—448.2 E **11 Claims**

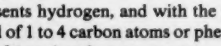
1. A method of preparing silylalkyl esters of phosphorus which consists of

(I) contacting and reacting silanes of the general formula

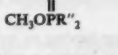
(i) $R_3SiR'X$ or siloxanes of the general formula

(ii) $Me_3SiO(Me_2SiO)_n(XR'MeSiO)_mSiMe_3$ or

(iii) oligomers of the general formula



with phosphorus compounds having the general formula



at a temperature in the range of 100° C. to 300° C. in the presence of amines or phosphines capable of forming onium compounds with the reactants, for a period of time sufficient to remove all by-produced organic halide, and then

(II) subjecting the resulting reaction mixture to a reduced pressure and an elevated temperature to remove undesired low boiling materials and

(III) thereafter recovering the silylalkyl ester of phosphorus, wherein

R is an alkyl group, aryl group, alkoxy group containing 1–4 carbon atoms, an R′X group or a siloxy group;

X is chlorine, bromine or iodine;

m is a positive integer;

n is 0 or a positive integer;

Me is methyl;

R′ is a divalent alkyl or aralkyl radical;

R″ is methyl, ethyl, phenyl, halobenzyl or —OR‴ wherein R‴ is methyl or phenyl.

4,093,642

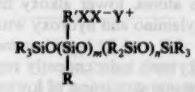
SURFACE ACTIVE SILICONES

Curtis L. Schilling, Croton-on-Hudson; Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,879
Int. Cl.[2] C07F 7/10
U.S. Cl. 544—106 10 Claims

1. A composition of matter selected from the group consisting of:

A. Siloxane compounds having the structural formula:



where

(1) R is a monovalent hydrocarbon group having from 1 to 18 carbon atoms,

(2) R′ is a divalent organic group whose valences are provided by carbon atoms and having from 1 to 18 carbon atoms,

(3) XX^- is a divalent anionic group covalently bonded to R′ and ionically bonded to Y^+,

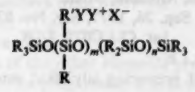
(4) Y^+ is a monovalent cation that has at least 8 carbon atoms and that is derived from a cationic surfactant having a halogen counterion by removal of the halogen and that is free of ionically-bonded hydrogen,

(5) *m* is an integer having a value from 1 to 100,

(6) *n* is an integer having a value from 0 to 200,

(7) the ratio of *m* to (*n*+2) being from 0.1 to 20, and

B. Siloxane compounds having the structural formula:



where

(1) R is a monovalent hydrocarbon group having from 1 to 18 carbon atoms,

(2) R′ is a divalent organic group whose valences are provided by carbon atoms and having from 1 to 18 carbon atoms,

(3) YY^+ is a divalent cationic group that is free of ionically-bonded hydrogen and that is covalently bonded to R′ and ionically bonded to X^-,

(4) X^- is a monovalent anion that has at least 8 carbon atoms and that is derived from an anionic surfactant having a monovalent metal counterion by removal of the metal,

(5) *m* is an integer having an average value from 1 to 100,

(6) *n* is an integer having a value from 0 to 200, and

(7) the ratio of *m* to (*n*+2) being from 0.1 to 20.

4,093,643

CATALYTIC FORMATION OF HYDROCARBONS FROM CO, H_2 MIXTURES AND PROCESS FOR MAINTAINING CATALYTIC ACTIVITY

M. Albert Vannice, Boalsburg, Pa., and Robert L. Garten, Summit, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 644,561, Dec. 24, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,574
Int. Cl.[2] C07C 1/04
U.S. Cl. 260—449 M 9 Claims

1. A process to produce low molecular weight organic compounds comprising substantially methane, said process consisting of the steps of passing a mixture of CO and H_2 over palladium supported on an acidic metal oxide selected from the group consisting of alumina and hydrogen-y-zeolite wherein the palladium metal particle size is maintained at less than 100 A by running at a reactor bed temperature of less than 350° C, at a pressure ranging from 1 to 500 atmospheres and at a GHSV of from 1200–4600 hr^{-1}

4,093,644

3-((4-(2,2-DICHLORO-1,1-DIFLUOROETHOXY)-2-METHYL-5-NITROPHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1977, Ser. No. 770,862
Int. Cl.[2] C07C 121/75
U.S. Cl. 260—465 F 1 Claim

1. The compound 3-((4-(2,2-dichloro-1,1-difluoroethoxy)-2-methyl-5-nitrophenyl)sulfonyl)-2-propenenitrile.

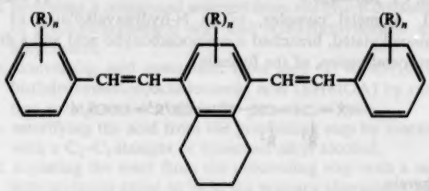
4,093,645

STYRYL-TETRAHYDRONAPHTHYL DERIVATIVES

Hugh Davidson, Castleford; Keith Trevor Johnson, Pontefract; Brian Ernest Leggeter, Wakefield, and Anthony John Moore, Leeds, all of England, assignors to Hickson & Welch Limited, Castleford, England

Division of Ser. No. 382,168, Jul. 24, 1973, Pat. No. 3,940,437. This application Nov. 28, 1975, Ser. No. 636,089
Claims priority, application United Kingdom, Jul. 26, 1972, 35033/72
Int. Cl.[2] C07C 143/24; D06P 1/00; D21H 1/46; C09K 11/00; C07C 143/42
U.S. Cl. 260—505 C 2 Claims

1. A compound of the formula



wherein R is —SO_3H, halo or alkoxy of 1–6 carbon atoms and *n* is 0, 1 or 2, at least one —SO_3H group being present; or a salt thereof.

4,093,646

REDUCTION OF NITRO COMPOUNDS WITH AQUEOUS SOLUTIONS OF A FORMATE

Peter Bamfield; Peter Michael Quan, and Trevor James Smith, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 28, 1975, Ser. No. 599,345
Claims priority, application United Kingdom, Aug. 19, 1974, 36361/74
Int. Cl.[2] C07C 143/56, 143/64, 101/72
U.S. Cl. 260—508 10 Claims

1. In a process for the reduction of aromatic nitro compounds selected from the class consisting of nitronaphthalene monosulphonic acids, nitronaphthalene disulphonic acids, nitronaphthalene trisulphonic acids, nitrobenzene sulphonic acids, dinitrobenzene sulphonic acids, dinitromesitylene sulphonic acid, substituted nitrobenzene sulphonic acids in which the substituents are selected from acetylamino, methyl, methoxy, hydroxy, aminoanilino, methoxyanilino, cyclohexylamino and β-(nitro-sulphophenyl)-ethenyl, and substituted nitrobenzene carboxylic acids in which the substituents are selected from acetylamino, hydroxy and sulphonic acid, the improvement which consists of treatment of said compounds with an aqueous solution of a formate in the presence of a hydrogenation catalyst based on platinum, palladium or ruthe-

nium at a temperature up to the boiling point and at a pH of 2 to 12.

4,093,647

PROCESS FOR OXYCARBONYLATION OF AROMATIC HYDROCARBONS

John J. van Venrooy, Media, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Aug. 22, 1977, Ser. No. 826,291
Int. Cl.[2] C07C 63/00
U.S. Cl. 260—515 R 8 Claims

1. A process for making aromatic carboxylic acids which comprises reacting at a temperature of from about 0° to about 100° C, an aromatic hydrocarbon of the benzene series having at least one ring carbon atom attached to a hydrogen atom with carbon monoxide at a pressure of from about 10 to about 500 psi in a solvent selected from the group consisting of lower aliphatic carboxylic acids, their anhydrides and mixtures thereof and in the presence of a mixture comprising thallium trifluoroacetate and a divalent palladium salt in a mole ratio of thallium to palladium of from about 10:1 to about 1000:1.

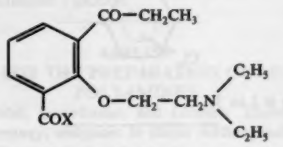
4,093,648

THERAPEUTICALLY ACTIVE BENZOIC ACID DERIVATIVES AND A PROCESS FOR PREPARING THEM

Enrico Sianesi, Milan; Giuseppe Bonola, San Donato Milan; Ivo Setnikar, Milan, and Maria José Magistretti, Milan, all of Italy, assignors to Recordati S.A. Chemical and Pharmaceutical Company, Chiasso, Switzerland

Filed Jun. 17, 1976, Ser. No. 697,154
Claims priority, application Italy, Jul. 16, 1975, 25448 A/75
Int. Cl.[2] C07C 65/08; A01N 9/24
U.S. Cl. 260—519 3 Claims

1. Therapeutically active 2- and 3-substituted benzoic acid derivative having the general formula



wherein X is OH and its alkaline or alkaline earth metal salts.

4,093,649

LIQUID PHASE OXIDATION OF UNSATURATED ALDEHYDES TO CARBOXYLIC ACIDS WITH A BISMUTH CATALYST

Jar-lin Kao, Cherry Hill, N.J., and John Joseph Leonard, Springfield, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 7, 1977, Ser. No. 766,112
Int. Cl.[2] C07C 51/32, 57/04, 57/06, 57/08
U.S. Cl. 260—530 N 10 Claims

1. A process for the liquid phase oxidation of an α,β-unsaturated aliphatic aldehyde containing from 3 to 6 carbon atoms in an inert solvent solution to the corresponding unsaturated aliphatic carboxylic acid which comprises contacting said aldehyde with oxygen or an oxygen-containing gas at a temperature of from about 0° C. to 100° C. and a pressure between about atmospheric and 1500 psig in the presence of from about 0.00001 to 0.5 mole of an inorganic or organic bismuth salt catalyst selected from the group consisting of bismuth chloride, bismuth bromide, bismuth iodide, bismuth oxide, bismuth nitrate, bismuth sulfate, bismuth carbonate, bismuth pentafluoride, bismuth pentoxide, bismuth citrate, bismuth oleate, bismuth tartrate, bismuth phenate and bismuth ammonium citrate or mixtures thereof, per mole of said aldehyde to effect an in situ decomposition of intermediate peroxide compounds formed during the oxidation to said unsaturated aliphatic carboxylic acid.

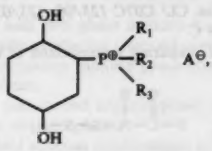
4,093,650

PROCESS FOR PREPARING TRIHYDROCARBYL (2,5-DIHYDROXYPHENYL) PHOSPHONIUM SALTS

George A. Doorakian, Bedford, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 23, 1976, Ser. No. 679,617
Int. Cl.[2] C07C 53/08
U.S. Cl. 260—539 A 12 Claims

1. A process for preparing a compound of the formula



wherein:

R_1, R_2 and R_3 are each independently hydrocarbyl or inertly-substituted hydrocarbyl groups of from 1 to about 20 carbon atoms, and $A^{\ominus}$ is an inert neutralizing anion; said process comprising reacting by contacting in essentially stoichiometric amounts

(a) a phosphine of the formula $R_1R_2R_3P$, wherein R_1-R_3 have the aforesaid meanings,

(b) p-benzoquinone, and

(c) a protic acid of the formula $H^{\oplus}A^{\ominus}$,

wherein $A^{\ominus}$ has the aforesaid meaning in a liquid reaction medium consisting essentially of a lower alkanol of from 1 to 4 carbon atoms, 1,2-ethylene glycol, 1,2-propylene glycol, diethylene glycol, dipropylene glycol, triethylene glycol, tripropylene glycol, or a lower alkyl (C_1-C_4) ether of said glycols, or a mixture thereof.

4,093,651

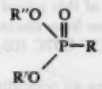
PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Milton L. Honig, Bronx; Carl C. Greco, Garnersville, and Edward N. Walsh, New City, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

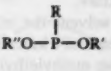
Filed Dec. 22, 1976, Ser. No. 753,119
Int. Cl.[2] C07C 145/00
U.S. Cl. 260—543 H 4 Claims

1. In a method for producing perchloromethyl mercaptan via the catalytic reaction of chlorine and carbon disulfide, the improvement which comprises:

(1) contacting the reactants with additive selected from the group consisting of phosphonates, phosphonites, or blends thereof, where said phosphonates are represented by the formula:



wherein R independently is hydrogen, hydrocarbyl, chlorine, or substituted hydrocarbyl; R′ and R″ independently are R but not chlorine; however, R, R′, and R″ cannot all be hydrogen simultaneously; and where said phosphonites are represented by the formula:



wherein R independently is hydrogen, hydrocarbyl, chlorine,

or substituted hydrocarbyl; R' and R'' independently are R but not chlorine or hydrogen; said additives being added to the reaction system in amounts which vary in the range of from about 0.01 to about 10% by weight of the carbon disulfide feed, and

(2) using an activated carbon catalyst inert to said additive.

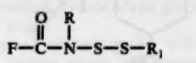
4,093,652

PROCESS FOR THE PREPARATION OF THIOSULFENYL CARBAMOYL HALIDES

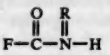
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 8, 1974, Ser. No. 486,631
Int. Cl.[2] C07C *125/00, 125/03*
U.S. Cl. 260—544 C 8 Claims

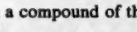
1. A method of preparing a compound of the formula:



which comprises reacting a compound of the formula:



with a compound of the formula:



in the presence of an organic base, wherein:

X is chlorine

R is lower alkyl, lower alkenyl or lower alkyl substituted with one or more chloro, bromo, fluoro, nitro or cyano substituents or phenyl or lower phenyl alkyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower haloalkyl or lower alkoxy substituents.

R_1 is alkyl, alkenyl, cycloalkyl, bicycloalkyl, cycloalkenyl or bicycloalkenyl or lower phenylalkyl or phenyl; or lower phenylalkyl or phenyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower alkoxy, lower haloalkyl, lower alkanoyl or carbamoyl substituents.

4,093,653

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE PHENYL GLYCINE AMIDE

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 8, 1976, Ser. No. 748,399
Claims priority, application Netherlands, Dec. 9, 1975, 7514300
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] C07C *103/28*
U.S. Cl. 260—558 A 11 Claims

1. A process for isolating an optically active form of phenyl glycine amide, from a mixture of D- and L-phenyl glycine amide, consisting essentially of:

preparing a mixture of D- and L-phenyl glycine amide and an optically active acid of the class consisting of 2-pyrrolidone-5-carboxylic acid and N-acetyl phenylglycine;

precipitating one antipode as diastereoisomer salt from a solution of said mixture;

and racemizing in a solvent the other antipode from the mixture in the presence of a ketone selected from the class consisting of acetone, methylethyl ketone and cyclohexanone and said optically active acid.

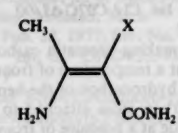
4,093,654

PRODUCTION OF PYRIDOXINE INTERMEDIATES FROM DIKETENE

David Llewellyn Coffen, Glen Ridge, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 31, 1977, Ser. No. 783,240
Int. Cl.[2] C07C *103/133*
U.S. Cl. 260—561 A 2 Claims

1. A compound of the formula:



wherein X is halogen.

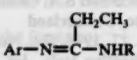
4,093,655

AMIDINE RICE HERBICIDES

George A. Miller, Glenside, and Marvin H. Fleischfresser, Warrington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

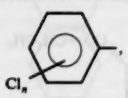
Filed Apr. 13, 1970, Ser. No. 28,038
Int. Cl.[2] C07C *123/00*
U.S. Cl. 260—564 RF 6 Claims

1. A compound of the formula



wherein R is a $(C_6–C_{10})$alkyl group, and

Ar is a group of the formula



wherein *n* is 1 to 3.

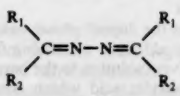
4,093,656

PROCESS FOR MAKING AZINES

Jean Pierre Schirmann, Oullins; Jean Combroux, Mornant, and Serge Yvon Delavarenne, Francheville-le-Haut, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sep. 10, 1976, Ser. No. 722,232
Claims priority, application France, Sep. 17, 1975, 75 28457
Int. Cl.[2] C07C *119/00*
U.S. Cl. 260—566 B 42 Claims

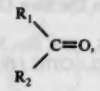
1. In the process for the production of azines of the general formula:



where R_1 and R_2 which may be identical or different represent hydrogen, linear alkyl groups having from 1 to 12 carbon atoms, branched alkyl or cycloalkyl groups having from 3 to 12 carbon atoms, or hydrocarbon having from 6 to 12 carbon atoms containing an aromatic ring or together R_1 and R_2 represent linear or branched alkylene having from 3 to 11 carbon atoms, these radicals being non-substituted or substituted by at least 1 chlorine, bromine or fluorine atom or by a nitro, hydroxy or alkoxy,

which process comprises reacting hydrogen peroxide in the

liquid phase with ammonia in the presence of a carbonyl compound, aldehyde or ketone, of general formula:



with R_1 and R_2 being defined as above, an amide of a monocarboxylic acid, the ionization constant of which is below 5×10^{-5} or an amide of a dicarboxylic acid at least one of the acid groups of which has an ionization constant below 5×10^{-5}, and a catalyst selected from the phosphates, phosphites, phosphonates, polyphosphates, pyrophosphates, arsenates, bicarbonates, antimonates, stannates or sulphonates of ammonium or alkali metals or the saturated alkyl (C_1–C_5) esters thereof,

the improvement comprising carrying out the process in the presence of the ammonium salt of the said monocarboxylic or dicarboxylic acid.

4,093,657

PROCESS FOR PREPARING MONOMER OF BILE ACID SEQUESTRANT POLYMER

Erwin F. Schoenewaldt, Watchung, and Paul Sohar, Warren, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 9, 1976, Ser. No. 675,375
Int. Cl.[2] C07C *85/04*
U.S. Cl. 260—567.6 M **3 Claims**

1. The process which comprises reacting together approximately equimolar quantities of N,N-bis(3-chloropropyl)methylamine and trimethylamine, said reaction being conducted in the presence of a polar organic solvent under conditions of time and temperature such that monoquaternization is substantially complete and diquaternization is minimized, thereby forming 3-[N-(3-chloropropyl) methylamine]-N,N,N-trimethyl-propan-1-aminium chloride.

4,093,658

PROCESS FOR THE PREPARATION OF AROMATIC POLYAMINES

Hartmut Knöfel, Leverkusen, and Günther Ellendt, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 29, 1975, Ser. No. 645,041
Claims priority, application Germany, Jan. 9, 1975, 2500574
Int. Cl.[2] C07C *85/24*
U.S. Cl. 260—570 D **10 Claims**

1. A process for the preparation of multinuclear aromatic polyamines comprising:

(A) condensing an aromatic amine with formaldehyde in the presence of a hydrophobic solvent and in the absence of an acid catalyst to produce a precondensate mixture containing the corresponding N,N′-disubstituted aminals,

(B) removing substantially all the water from said precondensate mixture to produce a first organic phase,

(C) mixing said first organic phase with an aqueous solution containing an acid catalyst thereby producing a first two-phase mixture,

(D) subjecting said first two-phase mixture to a first rearrangement reaction wherein a mono-N-substituted aminal is formed and wherein a second two-phase mixture is produced,

(E) separating said second two-phase mixture into a second organic phase and a first aqueous phase,

(F) subjecting said first aqueous phase to at least one more rearrangement reaction thereby producing an aqueous condensation mixture containing said aromatic polyamines,

(G) extracting said aqueous condensation mixture with a hydrophobic solvent to provide a solvent phase and a second aqueous phase comprising an aqueous solution containing the acid catalyst as an amine salt of said aromatic amine, and of said aromatic polyamines,

(H) recovering aromatic polyamines from said solvent phase, and

(I) returning said second aqueous phase to step (C).

6. A process for the preparation of multi-nuclear aromatic polyamines comprising:

(A) condensing an aromatic amine with formaldehyde in the presence of a hydrophobic solvent and in the absence of an acid catalyst to produce a precondensate mixture,

(B) removing substantially all the water from said precondensate mixture to produce a first organic phase,

(C) mixing said first organic phase with an aqueous solution containing an acid catalyst thereby producing a two-phase mixture,

(D) subjecting said two phase mixture to a rearrangement reaction thereby producing a second organic phase and an aqueous condensation mixture phase containing said aromatic polyamines,

(E) separating said second organic phase and said aqueous condensation mixture phase,

(F) extracting said aqueous condensation mixture phase with a hydrophobic solvent to provide a solvent phase and an aqueous phase comprising an aqueous solution containing the acid catalyst as an amine salt of said aromatic amine, and of said aromatic polyamines,

(G) recovering aromatic polyamines from said solvent phase, and

(H) returning said aqueous phase to step (C).

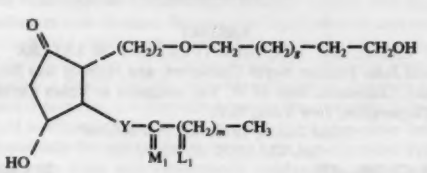
4,093,659

2-DECARBOXY-2-HYDROXYMETHYL-5-OXA-PGE$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,645
Int. Cl.[2] C07C *49/46, 49/80, 49/82*
U.S. Cl. 260—586 R **22 Claims**

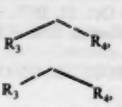
1. A prostaglandin analog of the formula



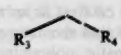
wherein Y is trans—CH=CH—;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is 1, 2, or 3; and
wherein *m* is 1 to 5, inclusive.

4,093,660

PROCESS FOR RECOVERING A DIALKYLARYLKETONE

Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 30, 1977, Ser. No. 782,630
Int. Cl.[2] C07C *49/76*
U.S. Cl. 260—591 **25 Claims**

1. A process for recovering a dialkylarylketone selected from the group consisting of 3,4,3',4'-tetramethylbenzophenone and 4,4'-dimethylbenzophenone from an oily mixture contaminated largely with the corresponding 1,1-diaryl-2-nitroethylene, said oily mixture having been obtained as a result of the nitric acid oxidation of a diarylalkane selected from the group consisting of 1,1-bis(p-tolyl)ethane and 1,1-bis(3,4-dimethylphenyl) ethane at a temperature below about 140° C. which comprises heating said mixture to a temperature of at least about 140° until solidification occurs and then recovering the dialkylarylketone as a solid from a solvent solution of the 1,1-diaryl-2-nitroethylene, said solvent being selected from the group consisting of alcohols, esters, ethers and hydrocarbons.

4,093,661

CATALYTIC DECARBONYLATION OF ESTERS

David John Trecker, South Charleston, and Michael Ray Sandner, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 4, 1973, Ser. No. 366,440
Int. Cl.[2] C07C *45/20, 47/02*
U.S. Cl. 260—595 **22 Claims**

1. A vapor phase process for the production of aldehydes and ketones, which comprises contacting a lower alkanoate ester of a primary or secondary alcohol, in the vapor phase, with an oxide of a metal selected from the group consisting of nickel, chromium, zinc, copper, manganese, cobalt, iron, titanium, and vanadium, at an elevated temperature and for a period of time sufficient to produce the aldehyde or ketone corresponding to said alcohol.

4,093,662

ETHER PHOSPHORIC ACID COMPOUND

Robert Harry Edwards; Thomas Alan Williams, and Kenneth Hall, all of Cumbria, England, assignors to Albright & Wilson Limited, Oldbury, England

Division of Ser. No. 437,891, Jan. 30, 1974, Pat. No. 3,947,499. This application Oct. 15, 1975, Ser. No. 622,485
Claims priority, application United Kingdom, Feb. 7, 1973, 06056/73
Int. Cl.[2] C07D *105/02, 107/02*; C01B *25/16, 25/26*
U.S. Cl. 260—606.5 P **2 Claims**

1. The solid anhydrous crystalline compound of formula $H_3PO_4 \cdot [(CH_3)_2CH]_2O$.

4,093,663

NOVEL ONIUM SURFACTANTS

Robert F. Harris, Midland, Mich., and Earl H. Wagener, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1973, Ser. No. 416,308
Int. Cl.[2] C07C *149/46*
U.S. Cl. 260—607 B **15 Claims**

1. An onium surfactant corresponding to the formula X $\{(CH_2CH_2O)_mCH_2—R—CHR'—Q^+A^-\}_n$ wherein X is a hydrophobic n-valent radical derived by the removal of n-atoms of active hydrogen from an organic compound and corresponding to the hydrophobic portion of a nonionic surfactant having a hydrophilic-lipophilic-balance of from 1 to about 30 and having the structural formula X $\{(CH_2CH_2O)_mH\}_n$; *m* is an integer of at least 1 and is the same in each of the above formulas; R is a divalent aromatic hydrocarbon radical of from 6 to about 14 carbon atoms, the chain length of which can be interrupted by oxygen or sulfur atoms; R' is hydrogen or methyl and is methyl only when R is m- or p-phenylene; Q^+ is a tertiary atom of sulfur; A^- is a compatible anion; and *n* is an integer of from 1 l to 5 and is the same in each of the above formulas.

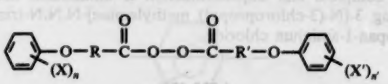
4,093,664

BIS HALOGENATED PHENOXYALKANOATES AND THE METHOD OF MAKING SAME

Lawrence H. Nash, Fort Lauderdale, Fla., assignor to Kalo Laboratories, Inc., Kansas City, Mo.

Filed Oct. 18, 1976, Ser. No. 733,178
Int. Cl.[2] C07C *179/14*; A01N *9/00*
U.S. Cl. 260—610 D **4 Claims**

1. A compound useful as a plant growth regulator and having the formula:



wherein X and X' are each chlorine atoms, R and R' are each alkyl groups containing from 1 to 4 carbon atoms and n and n' each have a value from 1 to 5.

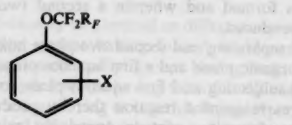
4,093,665

ARYL PERFLUORO-ALKYL ETHERS AND METHOD OF PRODUCING THEM

Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5-a, kv. 3., Odessa; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48., Kiev; Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28., Odessa; Sergei Vasilievich Sokolov, ulitsa 3 Internatsionala, 67, kv. 222., and Alexei Ivanovich Ponomarev, ulitsa Ziny Portnovoi, 21, Korpus 1, kv. 18., both of Leningrad, all of U.S.S.R.

Continuation of Ser. No. 628,237, Nov. 3, 1975, abandoned. This application Sep. 29, 1976, Ser. No. 728,598
Claims priority, application U.S.S.R., Nov. 1, 1974, 2071094
Int. Cl.[2] C07C *43/28, 41/00*
U.S. Cl. 260—612 D **2 Claims**

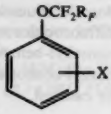
1. Aryl perfluoro-alkyl ethers of the formula



(I)

where
$R_F = CF_3$ or CF_2OCF_3, X = Br;
$R_F = CF_2OCF_3$, X = NO_2

2. A method of producing aryl perfluoro-alkyl ethers of the formula

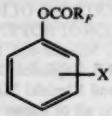


where

$R_F = CF_3$, CF_2OCF_3, X = Br;

$R_F = CF_2OCF_3$, X = NO_2,

which comprises fluorinating of aryl esters of perfluorocarboxylic acids of the general formula



(II)

where R_F and X are as defined above, with sulphur tetrafluoride in an autoclave at a temperature of 25°–100° C in hydrogen fluoride solution with the concentration of the starting esters in hydrogen fluoride being 20–50%.

4,093,666
PROCESS FOR THE MANUFACTURE OF GLYCOL ETHER FORMALS

Hans-Jürgen Arpe, Fischbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

Continuation of Ser. No. 546,901, Feb. 4, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,392

Claims priority, application Germany, Feb. 6, 1974, 2405633

Int. Cl.² C07C *41/00*

U.S. Cl. 260—615 A **10 Claims**

1. In a process for the production of an ethylene glycol monomethyl ether formal of the formula $[CH_3O(CH_2CH_2O)_n]_2CH_2$, wherein *n* is from 1 to 8, by reacting the corresponding ethylene glycol monomethyl ether with a 20 to 60% by weight aqueous formaldehyde solution in the presence of from 0.2 to 20% by weight, calculated on the ether, of an acid having a pK value of less than 4, the improvement which comprises reacting said ether and aqueous formaldehyde solution in the presence of a halohydrocarbon selected from the group consisting of dichloromethane, trichloromethane, tetrachloromethane, ethylene dichloride, 1,1,2-trichloroethane, 1,1,2-trichloro-trifluoroethane, tetrachloroethylene, isopropyl chloride, propyl chloride, propylene dichloride and butyl chloride, and distilling off water in a mixture comprising an azeotrope of water with said halohydrocarbon.

4,093,667
PREPARATION OF 4-N-HEXYLRESORCINOL

Charles Masterson Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 14, 1977, Ser. No. 777,755

Int. Cl.² C07C *39/08*

U.S. Cl. 568—766 **9 Claims**

1. A process for the preparation of 4-n-hexylresorcinol comprising; a) preparing hexylresorcyl ethers by reacting recorcinol with a hexylating agent having the general formula 1-$C_6H_{13}X$ at a temperature of from about 25° C to about 175° C in the presence of a base selected from the group consisting of the oxides, hydroxides, or carbonates of sodium, potassium, calcium, ammonium, magnesium, tetra-alkyl ammonium, berium, and lithium, and b) heating the reaction product of (a) to a temperature of from about 150° C to about 300° C in the presence of an acidic catalyst to yield 4-n-hexylresorcinol, wherein X is selected from the group consisting of Cl^-, Br^-, $CH_3SO_3^-$, $C_2H_5SO_3^-$, $C_2H_5OSO_3^-$, $CH_3OSO_3^-$, $ArSO_3^-$, and ONO_3^-or mixtures of these.

4,093,668
MANUFACTURE OF BUTYNEDIOL

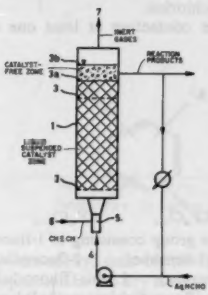
Wolfgang Reiss, Ludwigshafen; Hans-Ingo Joschek, Mannheim; Rudolf Schnur, Frankenthal; Siegfried Winderl, Heidelberg-Wieblingen; Juergen Dehler, Ludwigshafen, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Mar. 19, 1974, Ser. No. 452,565

Claims priority, application Germany, Mar. 24, 1973, 2314693

Int. Cl.² C07C *29/00*

U.S. Cl. 568—855 **4 Claims**



1. A continuous process for the manufacture of butynediol which comprises reacting acetylene and formaldehyde in a liquid medium containing particles of a metal acetylide on a catalyst support, said particles being suspended in the liquid medium, said particles having diameters in the range of 0.1 to 3 mm. and a macroscopic density of about 1.1 g/cm³, withdrawing liquid reaction product from the upper portion of said chamber, said liquid reaction product in said portion being substantially free of suspended catalyst particles, recycling a portion of said reaction product to the lower portion of said reaction chamber and supplying said recycled liquid reaction product into the lower portion of said chamber in admixture with fresh aqueous formaldehyde solution to form said liquid medium in said chamber, flowing said liquid medium upwardly through said reaction chamber at a liquid medium throughput of about 10 to 60 m^3 per m^2 per hour and provide in the reaction chamber a liquid medium velocity sufficient to maintain said catalyst particles in a suspended state in the upwardly flowing liquid medium with the upper zone of said liquid medium being substantially free of catalyst particles, said liquid product being withdrawn from said substantially catalyst-free upper zone, and feeding gaseous acetylene into the lower portion of said chamber with the gaseous acetylene finely distributed in the liquid medium at a rate at which the acetylene is virtually completely consumed in the liquid medium in said chamber.

4,093,669
METHOD FOR PREPARING TRICHLOROMETHYL-TRIFLUOROMETHYL-BENZENES

Erich Klauke, Odenthal, and Gerhard Büttner, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

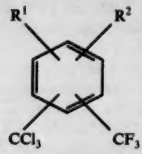
Filed Oct. 12, 1976, Ser. No. 731,479

Claims priority, application Germany, Nov. 3, 1975, 2548970

Int. Cl.² C07C *25/00*

U.S. Cl. 260—651 F **9 Claims**

1. A process for the preparation of a trichloromethyl-trifluoromethyl-benzene of the formula

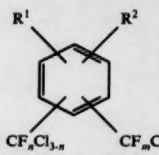


I

wherein

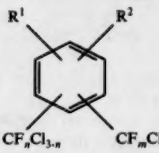
R^1 and R^2 are identical or different and represent hydrogen, fluorine or chlorine,

which comprises contacting at least one compound of the formula



II

selected from the group consisting of 1-fluorodichloromethyl-3-trichloromethyl-benzene, 1-fluorodichloromethyl-4-trichloromethyl-benzene, 1,3-bis-(fluorodichloromethyl)-benzene, 1,4-bis-(fluorodichloromethyl)-benzene, 2,4-bis-(fluorodichloromethyl)-chlorobenzene, 2,6-bis-(fluorodichloromethyl)-chlorobenzene, 2,5-bis-(fluorodichloromethyl)-chlorobenzene, 2,6-bis-(fluorodichloromethyl)-fluorobenzene, 2,4-bis-(fluorodichloromethyl-fluorobenzene, 2,5-bis-(fluorodichloromethyl)-1,4-dichlorobenzene, 1-fluorodichloromethyl-3-difluorochloromethylbenzene, 1-fluorodichloromethyl-4-difluorochloromethyl-benzene, 1,3-bis-(difluorochloromethyl)-benzene, 1,4-bis-(difluorochloromethyl)-benzene, 1,3-bis-(difluorochloromethyl)-5-chlorobenzene, 1,3-bis-(difluorochloromethyl)-5-bromobenzene, 1,4-bis-(difluorochloromethyl)-2-fluorobenzene, 1,4-bis-(difluorochloromethyl)-2-chlorobenzene, 1,3-bis-(difluorochloromethyl)-2-chlorobenzene, 1,4-bis-(difluorochloromethyl)-2,5-dichlorobenzene, 3-difluorochloromethyl-benzotrifluoride, 4-difluorochloromethyl-benzotrifluoride, 2-chloro-3-difluorochloromethyl-benzotrifluoride, 4-chloro-3-difluorochloromethylbenzotrifluoride, 4-bromo-3-difluorochloromethyl-benzotrifluoride and 2-fluoro-3-difluororochloromethyl-benzotrifluoride with a compound of the formula



II

wherein

R^1 and R^2 have the previously assigned significance,

said other compound also being selected from the group consisting of 1 -fluorodichloromethyl - 3 -trichloromethyl-benzene, 1-fluorodichloromethyl-4-trichloromethyl-benzene, 1,3-bis-(fluorodichloromethyl)-benzene, 1,4-bis-(fluorodichloromethyl)-benzene, 2,4-bis-(fluorodichloromethyl)-chlorobenzene, 2,6-bis-(fluorodichloromethyl)-chlorobenzene, 2,5-bis-(fluorodichloromethyl)-chlorobenzene, 2,6-bis-(fluorodichloromethyl)-fluorobenzene 2,4-bis-(fluorodichloromethyl)-fluorobenzene, 2,5-bis-(fluorodichloromethyl)-1,4-dichlorobenzene, 1-fluorodichloromethyl-3-difluorochloromethylbenzene, 1-fluorodichloromethyl-4-difluorochloromethyl-benzene, 1,3-bis-(difluorochloromethyl)-benzene 1,4-bis-(difluorochloromethyl)-benzenze, 1,3-bis-(difluorochloromethyl)-5-chlorobenzene, 1,3-bis-(difluorochloromethyl)-5-bromobenzene, 1,4-bis-(difluorochloromethyl)-2-fluorobenzene, 1,4-bis-(difluorochloromethyl)-2-chlorobenzene, 1,3-bis-(difluorochloromethyl)-2-chlorobenzene, 1,4-bis-(difluorochloromethyl)-2,5-dichlorobenzene, 3-difluorochloromethyl-benzotrifluoride, 4-difluorochloromethyl-benzotrifluoride, 2-chloro-3-difluorochloromethyl-benzotrifluoride, 4-chloro-3-difluorochloromethylbenzotrifluoride, 4-bromo-3-difluorochloromethyl-benzotrifluoride and 2-fluoro-3-difluorochloromethyl-benzotrifluoride in the presence of a halogen transfer catalyst.

4,093,670

PROCESS OF ISOMERIZING OLIGOMERS OF HEXAFLUOROPROPENE

Masahiro Ozawa, No. 1-6-8, Minami-dai, Kami-fukuoka City; Tadaaki Komatsu, No. 271-8, Fujikubo, Miyoshi-cho, Irumagun, Saitama Prefecture, and Kimiaki Matsuoka, No. 3-35-7, Kishi-machi, Kawagoe City, all of Japan

Filed Feb. 1, 1977, Ser. No. 764,652

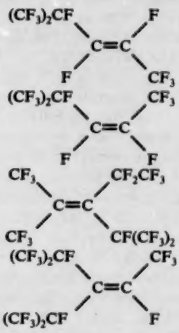
Claims priority, application Japan, Mar. 5, 1976, 51-23142

Int. Cl.[2] C07C *21/18*

U.S. Cl. 260—653.1 R **25 Claims**

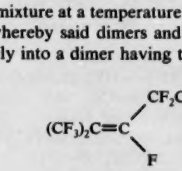
1. A process of isomerizing oligomers of hexafluoropropene into a thermodynamically stable isomer, comprising the steps of:

preparing a mixture of non-protonic polar solvent, an alkali metal fluoride, a crown ether and at least one of the following dimers and trimers of hexafluoropropene;

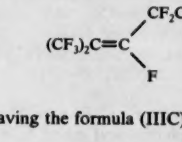


(IIA),

(IIA)$_c$



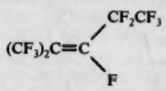
(IIIA)



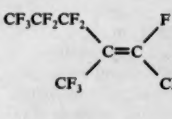
(IIIB)

and

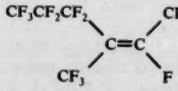
heating the mixture at a temperature in the range from 20 to 150° C, whereby said dimers and trimers are isomerized respectively into a dimer having the formula (IIB)



and a trimer having the formula (IIIC)$_a$



or



(IIIC)$_b$

4,093,671
HYDROALKYLATION USING MULTI-METALLIC ZEOLITE CATALYST

Timothy P. Murtha; William A. Jones, and Ernest A. Zuech, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1976, Ser. No. 744,060
Int. Cl.[2] C07C *15/00*
U.S. Cl. 260—668 R 10 Claims

1. A process for producing monocycloalkyl aromatic hydrocarbon and alkyl-substituted monocycloalkyl aromatic hydrocarbon which comprises:

contacting a monocyclic aromatic hydrocarbon or an alkyl substituted monocyclic aromatic hydrocarbon under hydroalkylation conditions and in the presence of hydrogen with a catalyst consisting essentially of at least one platinum compound supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite selected from the group consisting of Type X and Type Y Zeolite.

4,093,672
PROCESS FOR THE RECOVERY OF ULTRAHIGH PURITY INDENE

Yun Chung Sun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 691,129, May 28, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 815,965
Int. Cl.[2] C07C *7/14*
U.S. Cl. 260—674 R 6 Claims

1. A process for the recovery of indene in ultrahigh purity from liquid hydrocarbon mixtures, the mixtures comprising indene and organic impurities of which at least one has a melt point above indene and of which at least one has a melt point below indene, the mixture having a co-crystallization temperature at least about 5° C lower than the freezing temperature of the mixture, the process comprising:

(a) crystallizing a substantial portion of the indene from the mixture to form a slurry composed of mother liquor and crystals of indene; and

(b) separating the impurities from the resulting crystals by passing a non-reactive gas at a temperature in the range between the freezing and the co-crystallization temperatures of the mixture over the surfaces of the crystals to remove said impurities while maintaining the crystals and the residual mother liquor at a temperature in the range between the freezing and the co-crystallization temperature of the mixture.

4,093,673
COATING COMPOSITIONS COMPOSED OF HYDROXYFUNCTIONAL POLYMERS OR COPOLYMERS AND ALKOXYSILANES

Wen-Hsuan Chang; Rostyslaw Dowbenko, both of Gibsonia; Marvis E. Hartman, Pittsburgh, and Samuel Porter, Jr., Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1974, Ser. No. 523,781
Int. Cl.[2] C08L *43/04, 67/02, 75/06, 75/08*
U.S. Cl. 260—824 EP 35 Claims

1. A resinous coating composition comprising a blend of a hydroxyfunctional acrylic polymer with:

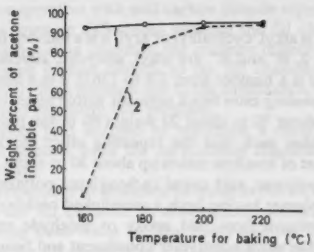
(A) from about 10 percent to about 50 percent by weight of polymer solids of an organoalkoxysilane crosslinking agent selected from the group consisting of Cellosolve silicate and phenyltrimethoxysilane; and

(B) from about 0.1 percent to about 2.0 percent by weight of polymer solids of a cure accelerating catalyst.

4,093,674
POWDER COATING COMPOSITION

Koichi Tsutsui, Kyoto, and Yoshio Eguchie, Ikeda, both of Japan, assignors to Nippon Paint Co., Ltd., Japan

Continuation of Ser. No. 420,463, Nov. 30, 1973, abandoned. This application Nov. 5, 1975, Ser. No. 629,131
Claims priority, application Japan, Nov. 30, 1972, 47-120535
Int. Cl.[2] C08L *67/02, 29/04;* C08G *18/62, 18/42*
U.S. Cl. 260—830 P 10 Claims



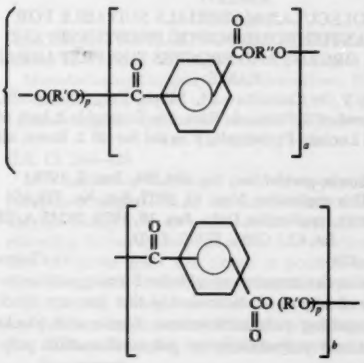
1. A substantially non-sticky, melt blended, thermosetting powder coating composition in the dry state which comprises at least one solid resin having a glass transition temperature of from 5° to 150° C and an OH content of 1×10^{-4} to 45×10^{-4} g equivalent/g, the OH group liberating an active hydrogen atom, and at least one polyisocyanate compound which is solid at room temperature and having at least two isocyanate groups in each molecule in an average weight ratio of about 99 : 1 to 30 : 70 and a molar proportion of the active hydrogen in the former to the isocyanate group in the latter of 1 : 0.2 - 2.

4,093,675
HIGH PEEL STRENGTH ADHESIVES

Ralph M. Schure, Darien; John H. Kooi, La Grange, and John M. Brown, Chicago, all of Ill., assignors to Unitech Chemical Inc., Chicago, Ill.

Filed Jun. 26, 1975, Ser. No. 590,622
Int. Cl.[2] C08L *67/02, 63/00, 61/06, 61/20*
U.S. Cl. 260—835 9 Claims

1. A high peel strength thermoset adhesive composition which comprises a cured carboxylated poly(ester/ether) block copolymer in which one of the blocks is itself a block copolymer, said cured copolymer being a hydroxy-terminated poly(ester/ether) block copolymer that has been extended and carboxylated with a tetracarboxylic dianhydride and that has been cured with an epoxy resin, a phenol-aldehyde resin, or an amine-aldehyde resin, said carboxylated poly(ester/ether) block copolymer being represented by the formula:



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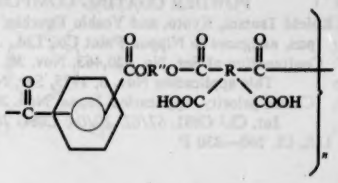


wherein R is alkyl, cycloalkyl or aryl, *n* is a number from about 1 to about 2, R′ and R″ are alkyl, alicyclic, acyclic, aryl, or arylalkyl, *p* is a number from 2.4 to 136.0, *a* is a number such that the repeating ester block segment within its set of brackets makes up about 70 to about 20 weight % of the polymer, and *b* is a number such that the repeating ether block segment within its set of brackets makes up about 30 to about 80 weight % of the polymer, said cured carboxylated poly(ester/ether) block copolymer having both a crosslinked carboxy acid network constituent from said epoxy or aldehyde resin and a linear flexible block copolymer constituent and being a creep-resistent, high-tensile thermoset adhesive that simultaneously exhibits high peel strength.

4,093,676

ANTISTATIC AGENTS FOR MELT-FORMED POLYMERS

Eugene A. Weipert, Allen Park, and Charles F. Deck, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 1, 1971, Ser. No. 177,136
Int. Cl.² C08L *77/00, 75/00, 67/00*
U.S. Cl. 260—857 PG **23 Claims**

1. A method for rendering a melt-formed polyamide and polyester polymer antistatic comprising:

incorporating with the polymer between about 1% and about 10% by weight based on the weight of said polymer of a polymeric composition which comprises the reaction product of

(a) a hydrogen reactive compound selected from the group consisting of

(1) organic polyisocyanate and

(2) alkyl ester of a dicarboxylic acid with

(b) an alkylene oxide adduct of a nitrogen-containing compound having a molecular weight of at least 1,000, the ratio of (a) to (b) being from about 0.5:1.0 to 1.0:1.0.

4,093,677

MACROMOLECULAR MATERIALS SUITABLE FOR FORMING ANTITHROMBOGENIC PROSTHESIS AND ARTIFICIAL ORGANS AND PROCESS FOR PREPARING SAME

Paolo Ferruti, V. le Cassiodoro 24, Milan; Ezio Martuscelli, Vico Monteroduni 8; Fernando Riva, Via Trigergola 2, both of Naples, and Luciano Provenzale, P.za dei Servili 2, Rome, all of Italy

Continuation-in-part of Ser. No. 694,394, Jun. 6, 1976, abandoned. This application Mar. 17, 1977, Ser. No. 778,454
Claims priority, application Italy, Jun. 10, 1975, 24245 A/75
Int. Cl.² C08L *77/00, 75/00*
U.S. Cl. 260—858 **16 Claims**

1. Macromolecular materials suitable for forming antithrombogenic artificial organs characterized in that they are block polymers comprising polyamidic-aminic blocks and blocks from conventional polyaddition or polycondensation polymers.

4,093,678

CRYSTALLINE CO-AND TERPOLYMERS OF ETHYLENE AND ACENAPHTHYLENE

Frederick Eugene Bailey, and Werner Claus von Dohlen, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,385
Int. Cl.² C08L *23/08*
U.S. Cl. 260—897 A **4 Claims**

1. A compatible blend of high density polyethylene and a highly crystalline non-uniform copolymer comprised of ethylene and acenaphthylene; said blend having a higher use temperature than said high density polyethylene by itself, said non-uniform copolymer being one which lacks the independent beta thermomechanical transition in the torsion pendulum loss modulus curve possessed by known copolymers of ethylene and which is produced by the process of initiating polymerization of a reaction mixture of acenaphthalene; ethylene; a Ziegler or Natta catalyst; and an organic solvent, and thereafter continuously introducing ethylene monomer to the reaction mixture during the polymerization reaction.

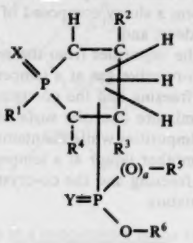
4,093,679

HYDROXYALKYL OR AMINOALKYL ESTERS OF PHOSPHOLANE PHOSPHONIC AND PHOSPHINIC ACIDS

Hans-Dieter Block, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 12, 1976, Ser. No. 741,576
Claims priority, application Germany, Nov. 21, 1975, 2552316
Int. Cl.² C07F *9/32, 9/40*
U.S. Cl. 260—927 R **2 Claims**

1. A hydroxyalkyl or aminoalkyl ester of a phospholane phosphonic or phosphinic acid of the formula



in which

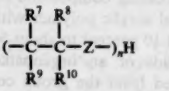
a is 0 or 1,

R^1 is alkyl with 1 to 10 carbon atoms or aryl with up to 14 carbon atoms,

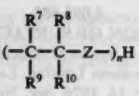
R^2, R^3 and R^4 each independently is alkyl with 1 to 4 carbon atoms, hydrogen, chlorine or bromine,

R^5 is alkyl with 1 to 8 carbon atoms and, where $a = 0$, optionally an aryl radical with up to 8

carbon atoms and, where $a = 1$, also optionally 1/m of an m-valent cation or a hydroxy alkylene or imino alkylene radical of the formula



R^6 is a hydroxy alkylene or imino alkylene radical of the formula



R^7 and R^8 each independently is hydrogen, alkyl with 1 to 6 carbon atoms, phenyl, alkenyl with 2 to 4 carbon atoms, chloromethyl, bromomethyl, hydroxy methyl or etherified or esterified hydroxy methyl, in addition to which R^7 and R^8 may together be an alkylene bridge of 2 to 4 carbon atoms to form a ring,

R^9 and R^{10} each independently is hydrogen or alkyl with 1 to 2 carbon atoms,

Z is oxygen or imino,

n is a number from 1 to 30, and

X and Y each independently is oxygen or sulphur.

4,093,680

PHOSPHORYLATED TERTIARY BUTYLATED PHENOL/PHENOL ESTER REACTION MIXTURES

Donald Richard Randell, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 586,756, Jun. 13, 1975, abandoned, which is a division of Ser. No. 370,455, Jun. 15, 1973, Pat. No. 3,919,158,

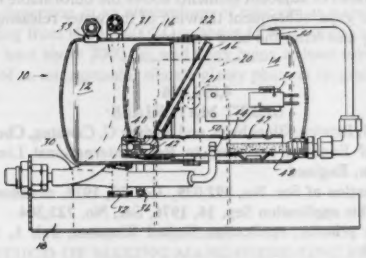
which is a continuation-in-part of Ser. No. 74,909, Sep. 23, 1970, abandoned, which is a division of Ser. No. 645,888, Jun. 14, 1967, Pat. No. 3,576,923, said Ser. No. 645,888. This application Jun. 16, 1976, Ser. No. 696,703

Claims priority, application United Kingdom, Jun. 18, 1966, 27316/66

The portion of the term of this patent subsequent to Mar. 2, 1988, has been disclaimed.

Int. Cl.[2] C07F *9/12*

U.S. Cl. 260—966 **3 Claims**



1. A phosphate ester composition consisting essentially of a phosphorylated tertiary butylated phenol/phenol ester mixture wherein the weight ratio of the tertiary butyl moiety to phenol moiety ranges from 0.10 to about 0.4, which ester is prepared by steps comprising:

(a) alkylating at a temperature of about 15° to 250° C in the presence of a Lewis acid or a Bronsted acid as a catalyst, phenol with isobutylene or diisobutylene to obtain a tertiary butylated phenol reaction mixture, and

(b) reacting said tertiary butylated phenol reaction mixture with a phosphorylating agent.

4,093,681

MOTORLESS CARBONATOR

Herman B. Castillo, Clawson, and Robert S. Mueller, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 13, 1976, Ser. No. 749,938

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—122 **5 Claims**

1. A carbonator for carbonating fluids comprising:

a housing defining a first fill chamber adapted to receive water and connected to a source of fresh water, and a second carbonation chamber;

fluid connection means having an inlet and outlet located within said housing, said inlet being in communication with the fill chamber and the outlet being in communication with said carbonation chamber, the connection means being adapted to transfer water from said fill chamber to said carbonation chamber;

means for supplying pressurized carbon dioxide to the fill chamber and to the carbonation chamber;

means cooperative with said carbon dioxide supply to maintain a pressure differential between the fill chamber and the carbonation chamber, the pressure differential means supplying carbon dioxide to the fill chamber at a first relatively high pressure and to the carbonation chamber at a second relatively low pressure;

a discharge port adapted to withdraw a carbon dioxide-water mixture from the carbonation chamber upon demand; and

means responsive to depletion of water in the fill chamber to vent the fill chamber to atmospheric pressure, thereby allowing fresh water to flow freely into the fill chamber filling the fill chamber to a predetermined level; and

means operative in response to filling of the fill chamber with water to the predetermined level to repressurize the fill chamber with carbon dioxide and stop filling.

4,093,682

PROCESS FOR THE PRODUCTION OF BLOCK-SHAPED FUEL ELEMENTS FOR HIGH TEMPERATURE REACTORS

Milan Hrovat, Rodenbach, and Lothar Rachor, Hanau, both of Germany, assignors to Hobeg Hochtemperaturreaktor - Brennelement GmbH, Hanau, Germany

Filed Feb. 14, 1977, Ser. No. 768,633

Claims priority, application Germany, Feb. 14, 1976, 2605975

Int. Cl.[2] G21C *3/38*

U.S. Cl. 264—0.5 **18 Claims**

1. In a process for the production of a hexagonally shaped block-fuel element for a gas cooled high temperature reactor by hot molding a granulated graphite material consisting essentially of a mixture of natural graphite, synthetic graphite and binder resin together with fissile and fertile coated fuel particles together with stearic acid as a lubricant to form molded blocks and wherein the blocks are subsequently heat treated and wherein the outer hexagonal shape of the block fuel element and the cooling gas channels are produced by molding, the improvement comprising incorporated into the matrix powder prior to molding an organic compound having a very low vapor pressure at room temperature and a vapor pressure of about 760 Torr at the molding temperature, of not over 200° C, said organic compound again being liquifiable under moderate pressure at the molding temperature.

4,093,683

METHOD FOR MAKING PIPE FITTING COVERINGS

Alfred H. Harley, Greensboro, N.C., assignor to Speed-Line Manufacturing Company, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 311,965, Dec. 5, 1972, abandoned.This application May 19, 1976, Ser. No. 687,657 .

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—25 **20 Claims**

1. A method of forming a cover for a pipe fitting having a complex configuration in the same complex configuration as the pipe fitting to be covered, said cover including an opening extending between the ends of the cover whereby the cover may be spread apart and placed in position surrounding the pipe fitting, said method comprising the steps of:

(a) forming a single piece of thermoplastic material into a preform having an intermediate non-planar configuration different from the complex configuration of the fitting to be covered,

(b) folding the preform into the final complex configuration of the fitting to be covered,
(c) heating the said material while retaining it in its final complex configuration, and
(d) cooling the said material to set it in its final complex configuration while retaining the said material in its said final complex configuration.

10. A method of making a pipe fitting cover from thermoplastic polymeric material as a single piece integral structure having a complex shape conforming to the configuration of the fitting to be covered, said pipe fitting cover including an opening extending between the ends of the pipe fitting cover whereby the pipe fitting cover may be spread apart and placed in position surrounding the pipe fitting, said method comprising the steps of:

(a) providing a sheet of thermoplastic polymeric material,
(b) forming said sheet of material into a preform having an intermediate configuration different from the configuration of the fitting to be covered,
(c) folding the preform from its intermediate configuration to its final configuration conforming to the configuration of the fitting to be covered,
(d) heating the preform above the softening temperature of the thermoplastic material while retaining the preform in its final configuration, and
(e) cooling the preform below the softening temperature of the thermoplastic material while retaining the preform in its final configuration to set it in the configuration of the fitting to be covered.

4,093,684

SOLID SOLDERABLE POLYURETHANE DATA SIGNAL RECORDING MEDIUM

Leo P. Parts, Dayton, and Edgar E. Hardy, Kettering, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 409,515, Oct. 25, 1973, abandoned, which is a continuation of Ser. No. 864,160, Oct. 6, 1969, abandoned. This application Jul. 21, 1977, Ser. No. 817,894

Int. Cl.[2] H05B *7/00;* **C08G** *18/80;* **C08F** *2/46;* **G01D** *5/48*

U.S. Cl. 264—25 **1 Claim**

1. In a process for data signal recording in which a recording medium is impinged upon by an intensity-modulated, focused laser beam to form a hole in at least one layer of the recording medium, the improvement wherein said one layer of the recording medium comprises a solid, solderable polyurethane polymer having the capability for undergoing residue free depolymerization when subjected to laser irradiation, said solderable polyurethane polymer being the heat-cured reaction product of a blocked polyisocyanate adduct having from 11.5 to 13.5 percent available NCO, and a polyester having a hydroxyl number of from 270 to 420 and an acid number of from 4.0 to 9.0, and the beam is of sufficient intensity to effect said depolymerization.

4,093,685

PRODUCTION OF SURFACING UNITS

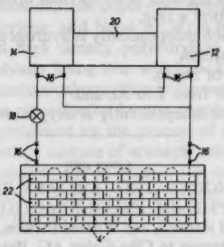
Frederick George Cond, Sutton Coldfield, England, assignor to Ibstock Building Products Limited, Leicester, England

Filed Dec. 14, 1976, Ser. No. 750,399

Claims priority, application United Kingdom, Dec. 23, 1975, 52687/75

Int. Cl.[2] B05B *3/00*

U.S. Cl. 264—28 **7 Claims**



1. A method of producing surfacing units composed of a plurality of elements of brick, tile, stone or the like connected by fillets of suitable mortar or other adhesive, comprising the steps of procuring a base member comprising a surface covering of deformable saturable material, saturating said material with a freezable liquid consisting essentially of water, laying the elements thereon in a spaced desired pattern such that the deformable material projects into the gaps between adjacent elements in the shape of a ridge, said base member being provided with freezing means whereby the water in said material is caused to freeze and thereby secure the elements in place while the mortar or adhesive is applied to the gaps between edge surfaces of adjacent elements above the deformable material in the gaps, subsequent thawing of the water releasing the surfacing unit from the base member.

4,093,686

SHEET MATERIALS

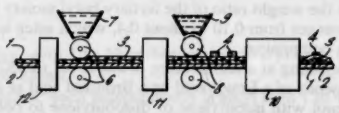
Rodney J. Briston, Blackburn, and Rodger G. Canning, Chorley, both of England, assignors to Reed International Limited, London, England

Continuation of Ser. No. 592,039, Jun. 30, 1975, abandoned. This application Sep. 14, 1976, Ser. No. 723,304

Claims priority, application United Kingdom, Jul. 1, 1974, 29145/74

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—45.5 **11 Claims**



1. A process for the manufacture of a differentially expanded resinous cellular sheet, comprising incorporating a heat decomposable blowing agent in a thermoplastic resinous composition; forming a sheet from said resinous composition; applying a lacquer, wherein at least part of the solvent phase of said lacquer is an organic solvent having an affinity for said resinous composition, to the surface of said resinous sheet containing said blowing agent and allowing said treated sheet to at least partially dry; applying a printing ink composition containing a kicker which depresses the decomposition temperature of said blowing agent to portions of said treated surface; and uniformly heating said treated sheet for a time and at a temperature so that those portions of the sheet which received an

application of printing ink composition expand to a greater extent than those portions which did not receive an application of printing ink composition to produce said differentially expanded sheet.

4,093,687

HOT PRESSING OF SILICON NITRIDE USING MAGNESIUM SILICIDE

Charles D. Greskovich, Schenectady, and Chester R. O'Clair, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,083
Int. Cl.² C04B *35/58, 35/64*
U.S. Cl. 264—65 4 Claims

1. A method of producing a hot-pressed polycrystalline silicon nitride body having a density of at least 80% of the theoretical density of silicon nitride and which retains at least about 75% of its room temperature mechanical properties at elevated temperatures ranging up to at least 1350° C in air which consists essentially of providing at least a significantly homogeneous powder dispersion having an average particle size which is submicron of silicon nitride and magnesium silicide, and based on the total composition of the starting silicon nitride powder said silicon nitride powder containing up to about 0.1% by weight of metallic impurities which react with SiO_2 or Si and O_2 to form low melting intergranular silicate glassy phase, up to about 3% by weight of oxygen, up to about 4% by weight of elemental silicon, and up to about 1% by weight of halogen, said magnesium silicide being used in an amount ranging from about 0.5% by weight to about 3% by weight based on the amount of silicon nitride, and hot-pressing said dispersion in an atmosphere of nitrogen at a temperature ranging from about 1600° C to about 1850° C under a pressure of at least about 2000 psi, said body being at least substantially free of an intergranular silicate glassy phase at its grain boundaries.

4,093,688

METHOD OF MAKING MANGANESE-ZINC FERRITE

Arthur Withop, and Roger Emil Travagli, both of San Jose, Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Aug. 25, 1975, Ser. No. 607,211
Int. Cl.² F27B *9/04*
U.S. Cl. 264—65 3 Claims

1. A method of producing a low porosity manganese-zinc ferrite body with high permeability and induction comprising the steps of:

(a) heating an isostatically-pressed body comprising Fe_2O_3, MnO and ZnO within a temperature range of about 1180°–1230° C in a vacuum environment of 50 to 200 microns pressure for a period of time of about 3 to 5 hours:

(b) heating the body within a temperature range of about 1180°–1230° C for at least 18 hours in an atmosphere having an oxygen partial pressure of about 0.2% to 0.4% oxygen, by volume, at atmospheric pressures;

(c) cooling the body to a temperature in the range of about 880°–920° C in said oxygen partial pressure atmosphere;

(d) then soaking the body at a temperature in the range of about 880° to 920° C in an atmosphere having less than 0.02% oxygen, by volume, for at least 18 hours; and

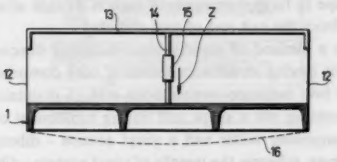
(e) cooling the body to less than 400° C in an atmosphere of less than 0.02% oxygen.

4,093,689

PROCESS FOR PRODUCING REINFORCED CONCRETE BUILDING UNITS, ESPECIALLY FLOOR PANELS HAVING SMOOTH SURFACES AND COFFER-LIKE INNER HOLES, AND FORMWORK ESPECIALLY FOR CARRYING OUT THE PROCESS

György Mayer; János Györi; Mihály Rikker; Antal Bánfai, and Ervin Eszenyl, all of Pecs, Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Mar. 14, 1974, Ser. No. 451,199
Int. Cl.² B28B *1/08*
U.S. Cl. 264—71 2 Claims



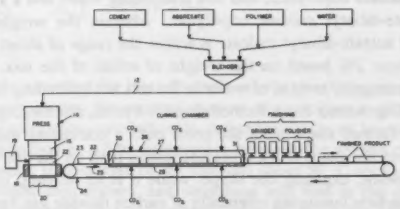
1. A process for the production of compressive prestressed reinforced concrete building units having smooth opposite surfaces and coffer-like inner holes, comprising connecting a mat of steel rods to the edges of ribs which are secured to a flat panel, pouring a layer of concrete onto a horizontal form plate the size of said panel, immersing said mat and rib edges in said concrete, vibrating said plate and panel to consolidate the concrete around the rods of said mat, prestressing said unit by flexing both said panel and said plate to the same upwardly concave curvature prior to hardening of said concrete, and then removing said plate and releasing the flexing of said panel after the concrete has hardened.

4,093,690

METHOD FOR THE MANUFACTURE OF CONCRETE AND LIKE PRODUCTS

John A. Murray, Norristown, Pa., assignor to U.S. Terrazzo Panels, Inc., Bryn Mawr, Pa.

Continuation of Ser. No. 534,203, Dec. 19, 1974, abandoned, which is a continuation of Ser. No. 336,362, Feb. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 106,364, Jan. 14, 1971, abandoned. This application Oct. 26, 1976, Ser. No. 735,502
Int. Cl.² C04B *15/14*
U.S. Cl. 264—82 13 Claims



1. A method of rapidly manufacturing concrete or like products having an advanced state of cure comprising the steps of blending together a calcareous cementitious binder, an aggregate, the binder being present in a percentage of about 6–100, based upon total of binder plus aggregate; vinyl acetate-dibutyl maleate copolymer and water to form a mix, wherein the percentage by weight of water does not exceed about 10%, wherein the weight of vinyl acetate-dibutyl maleate copolymer in the mix is within the range of about 1% to about 2% based on the solids content of the mix, compressing the mixture under sufficient pressure to maintain the mixture in a predeter-

mined shape upon removal of the shape relative to the mold, moving said shape in a predetermined direction and exposing the shape to a preignition in an ambient atmosphere containing admixed carbon dioxide moving counter-current to said shape, subsequently subjecting said shape to an atmosphere consisting essentially of carbon dioxide gas containing minor amounts of air by moving the shape through a chamber, simultaneously feeding carbon dioxide gas to the chamber during the movement of the shape therein, maintaining the pressure within the chamber at substantially atmospheric pressure, continuing the feed to cause an exothermic temperature rise in the shape of at least 20° to 40° F in less than about 5 minutes, and subjecting the shape to further amounts of carbon dioxide after its emergence from the exit end of said chamber.

9. In a method of rapidly manufacturing concrete or like products having an advanced state of cure comprising a sufficiently low moisture cementitious mix to maintain its shape after molding into a shape and during subsequent curing, said mix comprising water and a vinyl acetate - dibutyl maleate copolymer, wherein the weight of vinyl acetate - dibutyl maleate in the mix is within the range of about 1% to 2% based on weight of solids of the mix, the percentage by weight of water not exceeding 10%, the steps which comprise molding the mixture into a predetermined shape by compressing the mixture under sufficient pressure to maintain the mixture in the predetermind shape upon removal of the shape relative to the mold, moving the shape in a predetermined direction, exposing the shape while it is so moving to preignition in an atmosphere containing a controlled amount of carbon dioxide which is moving countercurrent to the movement of said shape, then exposing said shape to an atmosphere of carbon dioxide gas admixed with minor amounts of air by moving the shape through a chamber the inner surfaces of which are substantially non-metallic, the height of the chamber being about 1.025 to about 4 times the height of the shape, but not exceeding the height of the shape by more than about 4½ inches, simultaneously feeding carbon dioxide gas to the chamber during the movement of the shape therein, maintaining the pressure, and continuing the feed to cause an exothermic temperature rise throughout the shape of at least 20° F - 40° F in less than about 5 minutes.

11. The method of treating a mix having concrete forming characteristics or the like for facilitating the curing thereof comprising the steps of adding water and a vinyl acetate-dibutyl maleate copolymer, said mix comprising water and a vinyl acetate-dibutyl maleate copolymer, wherein the weight of vinyl acetate-dibutyl maleate is within the range of about 1% to about 2% based on the weight of solids of the mix, the percentage by weight of water in the mix not exceeding 10%, molding the mix into a formed shape in a press, discharging the then formed shape from the press onto a conveying means, moving the shape along a predetermined path on the conveying means, exposing the shape, while it is so moving, to an atmosphere consisting essentially of carbon dioxide gas during its movement along said path, causing said carbon dioxide gas to permeate said conveying means to subject said shape to said gas by flow of said gas through said conveying means, said exposing step being performed by passing the shape through a yieldingly shielded chamber while simultaneously continuously delivering carbon dioxide gas to the chamber, causing a portion of said carbon dioxide gas to flow counter-currently thereby causing a preignition of said shape before its entry into said chamber, maintaining the gas pressure in said chamber at substantially atmospheric pressure, all as part of a continuous process.

4,093,691
METHOD FOR MANUFACTURING MOULDED PLASTIC ARTICLES

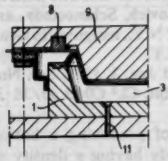
Gerardus Theodorus Joseph Eggen, 450, van der Helmstraat, Rotterdam 14, Netherlands

Continuation of Ser. No. 346,658, Mar. 30, 1973, abandoned. This application Jun. 23, 1975, Ser. No. 589,512

Claims priority, application Netherlands, Apr. 6, 1972, 7204628

Int. Cl.[2] B29C *17/04*

U.S. Cl. 264—93 **5 Claims**



1. A method for manufacturing articles from synthetic resin material by means of a mould, said method comprising heating pulverulent synthetic resin material to sintering temperature on a nonporous support to form a layer of said resin material on the support, mounting the support with the layer thereon on a mould, heating the material on the support to a softened deformable condition in which the surface of the material in contact with the non-porous surface of the support is rendered devoid of pores, attaching the softened deformable material to the mould along a circumferential region thereof, peeling the material from said support in the region where the material is attached to the mould by displacing the mould and support relative to one another in a direction away from one another to provide a free space around the circumference of the mould and applying a pressure medium via said free space against the material from the circumference thereof towards its center to continue the peeling of the material from the support and the introduction of the material into the mould to assume the form thereof.

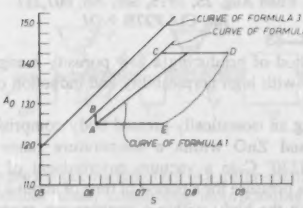
4,093,692
MELT EXTRUSION PROCESS

Donald R. J. Hill, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1977, Ser. No. 779,873

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—95 **6 Claims**



1. A process for preparing a melt extruded article of manufacture having improved physical properties which consists essentially of preparing such article by melt extruding a linear ethylene polymer at a shear stress of less than about 3×10^6 dynes/cm^2, said ethylene polymer being characterized by:

(a) having an annealed density of at least about 0.96 gms/ml,

(b) having melt flow properties such that the relationship between its slope parameter (s) and its apparent melt viscosity in poises at 1 sec.$^{-1}$(A_o) is defined by the formula:

$S \geq 0.0830A_o - 0.442$

where S is the negative slope of the curve obtained from a plot of the natural logarithm of the polymer's apparent viscosity in poises versus the natural logarithm of the apparent shear rate in sec.$^{-1}$; and where A_o is the natural logarithm of the polymer's apparent viscosity in poises measured at 1 sec.$^{-1}$ at 190° C;

(c) having an A_o value in the range of about 12.0 to about 14.5; and

(d) having an S value in the range of about 0.61 to about 0.90.

4,093,693

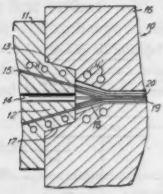
METHOD FOR MAKING COMPOSITE ARTICLES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 848,949, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 267,262, Mar. 22, 1963, Pat. No. 3,461,197, which is a continuation-in-part of Ser. No. 651,749, Apr. 9, 1957, abandoned. This application Feb. 22, 1971, Ser. No. 117,743

Int. Cl.^{2} B29F *3/10*

U.S. Cl. 264—171 **8 Claims**



1. A method for producing a composite article comprising:

rendering a first material in a molten condition,

passing said first material into a chamber in such molten condition,

rendering a second material having a melting point above that of said first material also in a molten condition,

continuously forcing said second material, while molten, through an orifice communicating with said chamber whereby said second material is formed to shape as it passes through said orifice and is passed continuously, as formed, into the molten first material in said chamber, and

surrounding said second material with said first material in said chamber and causing said first and second materials to completely fill said chamber,

transferring heat from said second material to said first material so as to solidify said second material within said first material, and

thereafter forming said first and second materials into an article by forcing said materials from said chamber and setting and solidifying said first material into a defined shape about said second material to provide a composite material composed of a discrete structural formation of said first and second materials.

4,093,694

METHOD OF MAKING A RUBBER ARTICLE HAVING A PERMANENT MARKING HEREIN

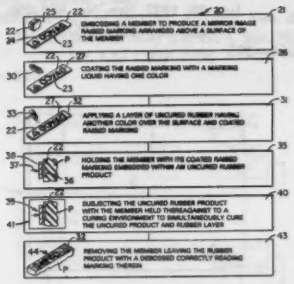
Vernon D. Browning, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 559,280, Mar. 17, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,922

Int. Cl.^{2} B29D *3/00*; B29H *3/06*

U.S. Cl. 264—246 **12 Claims**

1. A method of permanently marking a rubber article comprising the steps of, embossing a member to produce a mirror image raised marking arranged above a surface of said member, coating said raised marking with a layer of marking material having one color, applying a layer of uncured rubber having another color over said surface and layer of raised marking material, embedding said member with its layer of raised marking material within an uncured rubber article and holding said member therein, subjecting said uncured rubber article with said member held therein to a curing environment to simultaneously cure said uncured article while curing said



layer of uncured rubber as an integral outer part of said rubber article and removing said member member leaving said rubber article with a unitary two-layer debossed correctly reading marking therein defined by said layer of marking material and rubber, said two layers helping to assure the permanence of said marking.

4,093,695

PROCESS FOR MAKING POLYMERIC FILM

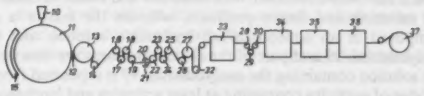
Wilfried André Heirbaut, Haasdonk, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 3, 1976, Ser. No. 663,497

Claims priority, application United Kingdom, Mar. 6, 1975, 9401/75

Int. Cl.^{2} B29D *7/24*

U.S. Cl. 264—289 **11 Claims**

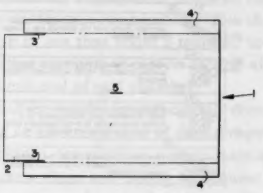


1. In a method for biaxially molecularly orienting polyester film comprising the successive steps of stretching a substantially amorphous crystallizable, polyester film in its longitudinal direction at a film temperature between the second order transition temperature of the film and about 50° C above said transition temperature, and stretching said film in the transverse direction at a temperature between the second order transition temperature of the film and about 50° C above said transition temperature, the improvement wherein between the longitudinal and transverse stretching steps the film is subjected to a thermal stress-relieving treatment by maintaining the film at a temperature which is between the second order transition temperature and about 30° C above said temperature and below the initial stretching temperature for a time insufficient to substantially increase its crystallinity, while the film is being subjected to a longitudinal tension which is not greater than half the longitudinal tension applied during the longitudinal stretching of the film.

4,093,696
METHOD OF MAKING A FLANGED FLUTED SELF-COILING SHEET

Edwin H. Land, Cambridge; Albert J. Bachelder, and Sarah H. Perry, both of Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 680,781, Apr. 27, 1976. This application Jun. 20, 1977, Ser. No. 808,050
Int. Cl.[2] B29D *15/00*
U.S. Cl. 264—295 3 Claims



1. The process of making a flexible film retaining imbibition chamber from a sheet of material that is curable to a springlike state, comprising the steps of folding the edges of said sheet of material over to form a pair of side flanges, fluting the side flanges and adjacent portions of the underlying sheet by deformation under sufficient stress to produce permanent departures alternately in opposite directions from the planes of the material, coiling the fluted material into a helix, and curing said coiled and fluted material.

4,093,697
PROCESS FOR RECOVERING MOLYBDENUM-99 FROM A MATRIX CONTAINING NEUTRON IRRADIATED FISSIONABLE MATERIALS AND FISSION PRODUCTS

Ali Sameh Abdel Hadi, Ettlingen-Schluttenbach; Peter-Michael Menzler, and Johann Reinhardt, both of Eggenstein-Leopoldshafen, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Mar. 14, 1977, Ser. No. 777,626
Claims priority, application Germany, Mar. 16, 1976, 2610947
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—2 12 Claims

1. Process for recovering molybdenum-99 from a matrix which has been irradiated with neutrons and contains fissionable materials and fission products, wherein the matrix is decomposed in an aqueous alkali hydroxide solution and the molybdenum-99 and part of the fission products are dissolved, the solution containing the molybdenum-99 is separated from a residue of particles containing at least actinides and lanthanides and is treated with thiocyanate ions to form a molybdenum complex comprising the steps of:

(a) conditioning the alkali solution containing molybdenum in the form of molybdate (MoO_4^{--}) with an iodine reduction agent in a quantity corresponding to a concentration range between 10^{-4} Mol and 0.2 Mol per liter alkali solution;

(b) adding mineral acid to the alkali solution until a hydronium ion concentration in the range from 0.1 to 6 Mol/l has been reached.

(c) reducing the molybdenum contained in the acidified solution of step b) to form a three-valent molybdenum Mo(III) and complexing the Mo(III) with SCN^- ions to form $[Mo(SCN)_6]^{3-}$ ions, said SCN^- ions being present in an ion concentration in the range between 0.1 Mol/l and 3 Mol/l of the solution being subjected to the reduction;

(d) bringing the aqueous acid solution from step c) as an aqueous phase which contains $[Mo(SCN)_6]^{3-}$ ions and contaminants into contact with an organic phase of previously conditioned di-sec butyl ether and selectively extracting the molybdenum thiocyanate complex ions from the aqueous phase into the organic phase, whereby the contaminants remain practically completely in the aqueous phase;

(e) separating the organic phase charged with $[Mo(SCN)_6]^{3-}$ ions from the molybdenum free solution;

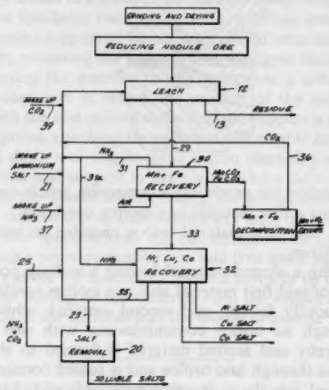
(f) washing the separated organic phase with diluted mineral acid having a concentration in the range from 0.001 to 0.1 Mol/l in a quantity approximately corresponding to the volume of the organic phase;

(g) re-extracting the molybdenum with mineral acid of a concentration in the range from 5 Mol/l to 11 Mol/l from the separated and washed organic phase into an aqueous phase.

4,093,698
PROCESS FOR THE SIMULTANEOUS EXTRACTION OF METAL VALUES FROM MANGANESE NODULES

Paul H. Cardwell, Zanoni, and William S. Kane, Wicomico, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Oct. 18, 1976, Ser. No. 733,087
Int. Cl.[2] C01G *3/14, 51/12, 53/12*
U.S. Cl. 423—24 16 Claims



1. A process for removing the metal values from a manganese nodule ore, the ore comprising a primary proportion of manganese and iron and secondary proportions of nickel, copper and cobalt, the weight ratio of manganese:iron being at least about 5:1 and the total combined amounts of copper, cobalt and nickel being at least about 1.5% by weight of the nodule are, the process comprising:

(a) comminuting the ore to a particle size of not greater than about 20 mesh;

(b) reducing the comminuted ore at a temperature in the range of from about 300° to about 850° C., in the presence of a reducing agent selected from the group consisting of carbonaceous materials and hydrogen, such that substantially all of the manganese, nickel, cobalt and copper values and only a portion of the iron value are reduced to a condition in which the metal values are leachable by ammoniacal ammonium salt solutions with oxidation;

(c) leaching the reduced ore with an ammoniacal aqueous leaching solution of an ammonium salt wherein the total concentration of total ammonium ion is at least about 260 grams/liter, the concentration of ammonium hydroxide in the leaching solution being at least about 120 grams/liter, as ammonium ion, and wherein the concentration of the ammonium salt anion is at least about 0.83 Normal to form an aqueous pregnant leach solution comprising the soluble manganese, iron, nickel, copper and cobalt salts and at least a major amount of the ammonium hydroxide gener-

ated during the leaching step, and a solid residue, the ore and the leach solution being oxidized prior to completion of the leaching, the ratio of iron-to-manganese in the solution being less than that in the ore;

(d) treating the pregnant leach solution to remove sufficient ammonia to obtain the precipitation of substantially all of the iron and manganese values from the pregnant leach solution without substantial precipitation of any nickel, cobalt and copper to form a substantially manganese-and-iron-free pregnant leach solution and solid manganese and iron compounds; and

(e) separating the nickel, cobalt and copper values from the manganese-and-iron-free pregnant leach solution so as to regenerate the ammoniated ammonium salt leaching solution.

14. The process of claim 1, comprising contacting the leach solution with an organic water-immiscible, liquid ion exchange extracting medium comprising an extracting agent selected from the group consisting of alpha-hydroxyoximes and 7-hydrocarbon-substituted-8-hydroxyquinolines so as to selectively extract copper, forming an organic phase containing the copper value, substantially free of cobalt and nickel values, and connecting the first raffinate with a second organic, water-immiscible, liquid ion exchange medium comprising an extracting agent selected from the aforesaid group so as to selectively extract nickel, forming a second organic phase containing the nickel value and a second aqueous raffinate containing the cobalt value.

4,093,699

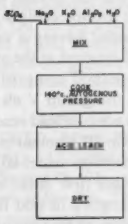
SYNTHETIC ZEOLITE

Leonard B. Sand, Holden, Mass., assignor to Zeochem Corporation, Worcester, Mass.

Continuation of Ser. No. 543,652, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 334,125, Feb. 20, 1973, abandoned, which is a continuation of Ser. No. 148,730, Jun. 1, 1971, abandoned. This application Nov. 10, 1976, Ser. No. 740,733

Int. Cl.[2] C01B *33/28*

U.S. Cl. 423—118 **4 Claims**



1. A method for making a zeolite having the structure of offretite, as determined by x-ray defraction, and capable of absorbing 0.512 mmoles of benzene per gram of zeolite at P/Ps of 0.669, comprising reacting in a closed container filled with a composition of ½ of its capacity under autogenous pressure and in the absence of tetramethylammonium ions, the composition having oxide mole ratios of:

$$(K_2O)0.65(Na_2O)_2(SiO_2)_{12}(Al_2O_3)(H_2O)36.11$$

wherein the source of silica is diatomite the composition being maintained at a temperature of between approximately 140° C. and 145° C inclusive, for a time sufficient to form the zeolite.

4,093,700

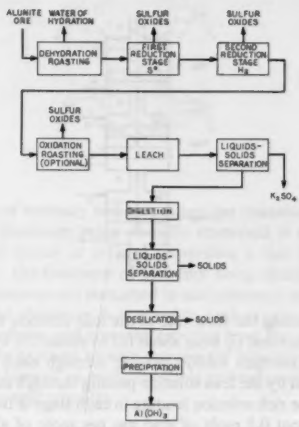
PROCESS FOR REDUCTION OF ALUNITE ORE IN ALUMINUM RECOVERY PROCESS

Kent W. Loest, Broomfield, and George H. Kesler, Evergreen, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 655,085, Feb. 4, 1976, abandoned. This application May 27, 1977, Ser. No. 801,054

Int. Cl.[2] C01F *7/06*

U.S. Cl. 423—120 **10 Claims**



1. A method for recovering aluminum from alunite ore which comprises:

(a) dehydrating the ore;

(b) roasting the dehydrated ore in a reducing atmosphere of sulfur at a temperature up to about 650° C to effect about 65–90 percent reduction of the ore;

(c) roasting the reduced ore of step (b) at a temperature up to about 650° C in a reducing atmosphere other than sulfur to substantilly completely reduce it;

(d) leaching the reduced ore from step (c) with a solvent selected from the group consisting of an alkaline solvent and water to remove compounds of sulfur and alkali metals;

(e) digesting the residue from step (d) with at least one alkali metal hydroxide to convert aluminum values in the residue to soluble aluminates; and

(f) recovering aluminum values from the soluble aluminates.

4,093,701

PROCESS FOR ACID GAS REMOVAL

Kenneth Francis Butwell, Newburgh, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 627,211, Oct. 30, 1975, abandoned. This application Sep. 17, 1976, Ser. No. 723,161

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—228 **28 Claims**

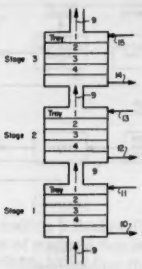
1. In a continuous process for the selective absorption of hydrogen sulfide from a feed gas comprising an acid gas mixture of carbon dioxide and hydrogen sulfide, said process comprising t[1] steps of (I) counter-currently contacting the feed gas in an absorption zone with a lean aqueous alkanolamine solution to provide a rich aqueous alkanolamine solution, (II) introducing the rich solution into a stripping zone to provide a mixture of acid gas and water vapor overhead and lean solution as bottoms, and (III) recycling the lean solution to the absorption zone, the improvement which comprises:

(a) using an alkanolamine having the formula, $(R)_3N$, wherein R is an alkanol radical, which has 2 or 3 carbon atoms and is unsubstituted or methyl-substituted, or an

alkyl radical having 1 to 5 carbn atoms, provided at least one of the R groups is an alkanol radical;

(b) using a lean solution, which has a molality of about 1.5 to about 75 and a maximum loading of about 0.1 mole of acid gas per mole of alkanolamine;

(c) using an absorption zone having 2 to 10 separate stages, wherein the equilibrium approach between the hydrogen sulfide in the gas and liquid phases is maximized and the equilibrium approach between the carbon dioxide in the gas and liquid phases is minimized;



(d) adjusting the flow rate of the lean solution through each stage so that (i) from about 0.1 to about 0.9, by volume, of the hydrogen sulfide passing through each stage is absorbed by the lean solution passing through said stage, and (ii) the rich solution loading in each stage is from about 0.1 to about 0.3 mole of acid gas per mole of alkanolamine; and

(e) introducing lean solution from the stripping zone into about the top of each stage, removing rich solution from about the bottom of each stage and introducing said rich solution into the stripping zone.

4,093,702

METHOD OF REMOVING GASEOUS POLLUTANTS FROM GAS STREAMS UTILIZING AN ACTIVATED FORM OF ALUMINUM

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07641

Continuation of Ser. No. 346,772, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,364, Nov. 2, 1970, abandoned. This application Feb. 14, 1977, Ser. No. 768,573

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.² B01D *53/34*

U.S. Cl. 423—235 **12 Claims**

5. A process of removing pollutants selected from NO and NO_2 from a gaseous stream containing the same, which comprises:

contacting said gaseous stream, in an aqueous medium, with a bed of reactive aluminum comprising:

(a) aluminum metal of a purity of at least 99.9% by weight permeated with

(b) an effective activating amount of a liquid metal selected from mercury, gallium and indium/gallium alloys.

4,093,703

REMOVAL OF ETHYLENE FROM GASES

Oskar Buechner, Ludwigshafen; Herbert Geierhaas, Heidelberg; Volker Gierth, Ludwigshafen; Siegfried Mueller, Limburgerhof, and Wieland Zacher, Wesseling, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 638,955, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 621,522, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 431,580, Jan. 7, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 763,927

Claims priority, application Germany, Jan. 10, 1973, 2301016

Int. Cl.² B01D *53/34*

U.S. Cl. 423—245 **1 Claim**

1. A process for the oxidative removal of ethylene from industrial exhaust air which comprises: passing said industrial exhaust air which contains ethylene in a concentration of not more than 1.8% by volume over a supported palladium catalyst containing from 0.05 to 10 g of palladium per liter of an inert inorganic carrier, said oxidation reaction being started at a temperature of from 180° to 200° C.

4,093,704

METHOD FOR SYNTHESIS OF III-V COMPOUNDS

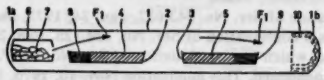
Guy Michel Jacob, Creteil, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 541,436, Jan. 16, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,735

Claims priority, application France, Jan. 16, 1974, 74 01402

Int. Cl.² C01B *25/00*; C22C *28/00, 30/00*

U.S. Cl. 423—299 **9 Claims**



1. A method for the synthesis of a III–V semiconductor compound, wherein the group III element is selected from the group consisting of gallium and indium and the group V element is selected from the group consisting of phosphorus and arsenic, the group V element having a vapor pressure higher than that of the group III element at the synthesis temperature of said compound, said method comprising: placing in a first zone in a reaction vessel the group V element in non-gaseous form, placing in a second zone, in said reaction vessel, adjacent to said first zone, the group III element in liquid form, providing a third zone in said reaction vessel adjacent to said second zone and remote from said first zone, closing said reaction vessel, providing a temperature in said first zone higher than the evaporation temperature of said group V element, providing a temperature in said second zone higher than the liquifying temperature of said group III element but below the melting temperature of said III–V compound, the temperature in said second zone being substantially higher than the temperature in said first zone; providing a temperature in said third zone sufficiently low to cause condensation of said group V element in said third zone and sufficiently below the temperature in said first zone to cause a larger quantity of said group V element to be evaporated than is absorbed in said group III element liquid, maintaining said temperatures in said zones until all of said group V element in said first zone has evaporated and then reversing the temperatures in said first and third zones until all of the V element condensed in said third zone has evaporated.

4,093,705

CONTROL OF CARBON BLACK PRODUCTION

Gerard Kraus; Carl J. Stacy, and Paul J. Cheng, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1976, Ser. No. 728,825
Int. Cl.[2] C01B 31/02; C09C 1/48; G01N 31/00, 29/02
U.S. Cl. 423—450 8 Claims

1. In a method of producing carbon black by introducing a carbonaceous feed material into a carbon black reactor, heating the feed material to an elevated temperature to decompose the feed material to produce carbon black particles, and withdrawing from the reactor an effluent stream which contains carbon black particles, the improvement which comprises controlling the structure of the thus produced carbon black particles by:

withdrawing a sample of the reactor effluent from said effluent stream and passing the thus withdrawn sample to an analysis zone, said sample containing carbon black particles:

introducing a beam of light into the analysis zone to impinge on the sample therein;

measuring the intensity of light scattered from the sample in said analysis zone in two different directions;

establishing a signal representative of the ratio of the two measured intensities; and

introducing an alkali metal into the reactor at a rate which is a function of the established signal so as to tend to maintain the established signal substantially constant at a predetermined value.

4,093,706

METHOD OF PRODUCTION OF SYNTHETIC FLUORITE HAVING A SELECTED GRAIN SIZE

Władysław Augustyn; Maria Dzięgielewska, both of Gliwice, and Andrzej Kossuth, Katowice, all of Poland, assignors to Politechnika Slaska and Instytut Chemii Nieorganicznej, both of Gliwice, Poland

Filed Oct. 21, 1976, Ser. No. 734,594
Claims priority, application Poland, Nov. 13, 1975, 184737
Int. Cl.[2] C01F 11/22
U.S. Cl. 423—490 14 Claims

1. A method for the production of synthetic fluorite having a controlled selected grain size in the range from about 1 μm to 20 mm by reacting 1 mole of calcium carbonate having substantially said selected grain size with an aqueous solution of 2 to 6 moles of a fluoride selected from the group consisting of ammonium, potassium and sodium fluorides at a temperature in the range of 50° C. to 150° C. for a period of 1 to 120 hours to produce fluorite grains of said selected grain size which reproduce the size and shape of the grains of the calcium carbonate.

4,093,707

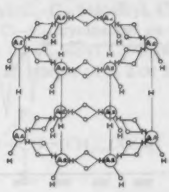
PROCESS FOR PREPARING PEROXIDE GROUP CONTAINING ALUMINUM COMPLEX

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07641

Continuation-in-part of Ser. No. 176,907, Sept. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 859,703, Sept. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 712,888, Feb. 19, 1968, abandoned. This application Nov. 17, 1975, Ser. No. 632,727
Int. Cl.[2] C01F 7/02
U.S. Cl. 423—626 12 Claims

1. A method of preparing a complex of aluminum, oxygen and hydrogen, which comprises reacting by contacting, at a temperature below 150° F., aluminum metal of a purity of at least 99.98% by weight with an aqueous inorganic halogen acid in the presence of mercury and an oxygen gas containing atmosphere, said aluminum being partially immersed in said mercury and said aqueous inorganic halogen acid comprising a thin film over said mercury, the thickness of said film being insufficient to cover the aluminum not immersed in said mercury, whereby a portion of said aluminum is exposed to said oxygen gas containing atmosphere, said complex growing from the surface of said aluminum exposed to said oxygen gas containing atmosphere in the form of an easily frangible self-supporting sheet; and collecting said complex.

12. A method of preparing a complex of aluminum, oxygen and hydrogen, which comprises stripping aluminum metal of a purity of at least 99.98% by weight of surface oxide film, reacting by contacting at a temperature below 150° F the surface stripped aluminum metal with a source of protons in



the presence of mercury and an oxygen gas containing atmosphere, said aluminum being partially immersed in said mercury and said source of protons comprising a thin film over said mercury, the thickness of said film being insufficient to cover the aluminum not immersed in said mercury, whereby a portion of said aluminum is exposed to said oxygen gas containing atmosphere, said complex growing from the surface of said aluminum exposed to said oxygen gas containing atmosphere in the form of an easily frangible self-supporting sheet; and collecting said complex.

4,093,708

OSMOTIC RELEASING DEVICE HAVING A PLURALITY OF RELEASE RATE PATTERNS

Alejandro Zaffaroni; Alan S. Michaels, both of Atherton, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 536,006, Dec. 23, 1974, Pat. No. 4,036,227, which is a continuation-in-part of Ser. No. 354,344, Apr. 25, 1973, abandoned. This application Mar. 9, 1977, Ser. No. 775,988
Int. Cl.[2] A61K 9/22
U.S. Cl. 424—15 1 Claim

1. A method for administering an ophthalmic drug to the tear fluid of the eye comprising,

a. placing in the eye tear fluid an osmotic device comprising;

1. a shaped wall formed of a semipermeable material that maintains its integrity during the dispensing period, is permeable to the passage of eye fluid and essentially impermeable to the passage of drug;

2. the wall surrounding and forming a compartment containing an ophthalmic drug that exhibits an osmotic pressure gradient across the wall against the eye fluid;

3. a layer formed of a material that bioerodes in the eye tear fluid on at least a part of the exterior surface of the semi-permeable wall;

4. a passageway in the wall, said passageway communicating with the compartment and the exterior of the device for dispensing drug from the device;

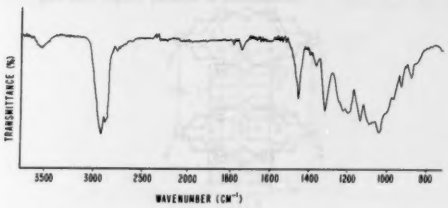
b. bioeroding the layer in the eye tear fluid at a controlled rate to regulate the amount of eye fluid available to the wall for imbibition, which fluid is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determind by the permeability of the wall and the osmotic pressure gradient across the wall continuously dissolving drug; and thereby,

c. dispensing drug from the device to the eye tear fluid through the passageway at a controlled rate over a prolonged period of time.

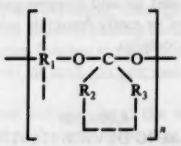
4,093,709
DRUG DELIVERY DEVICES MANUFACTURED FROM POLY(ORTHOESTERS) AND POLY(ORTHOCARBONATES)

Nam Sok Choi, Seoul, South Korea, and Jorge Heller, Palo Alto, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jan. 28, 1975, Ser. No. 544,808
Int. Cl.[2] A61K *9/22, 9/56;* A61M *37/00*
U.S. Cl. 424—19 **31 Claims**



1. A drug delivery device for the controlled and continuous administration of drug, wherein the device comprises: (a) a shaped matrix sized and adapted for administering drug to an animal and formed of a bioerodible drug release rate controlling pharmaceutically acceptable material, which material comprises a polymer of the formula:



wherein R_1 is a member selected from the group of divalent, trivalent and tetravalent radicals consisting of alkylene of 1 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with an alkyl of 1 to 7 carbons, alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; cycloalkenylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; arylene; and arylene substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, and an alkenyl of 2 to 7 carbons; R_2 and R_3 are selected from the group consisting of alkyl of 1 to 7 carbons; alkenyl of 2 to 7 carbons; alkoxy of 1 to 7 carbons; alkenyloxy of 2 to 7 carbons; alkylene of 2 to 6 carbons; alkenylene of 3 to 6 carbons; alkyleneoxy of 2 to 6 carbons; alkenyleneoxy of 3 to 6 carbons; aryloxy; aralkyleneoxy of 8 to 12 carbons; aralkenyleneoxy of 8 to 12 carbons; oxa; OR_1O with R_1 as defined above; a heterocyclic ring of 5 to 8 carbon and oxygen atoms formed when R_2 and R_3 are taken together; a heterocyclic ring of 5 to 8 carbon and oxygen atoms substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 carbon and oxygen atoms formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 carbon and oxygen atoms substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons; and wherein at least one of said R_2 and R_3 is a member selected from the group consisting of alkoxy, alkenyloxy and OR_1O; R_2 and R_3 when taken together are a member selected from the group of heterocyclic and fused polycyclic rings having at least one oxygen atom in the ring; and wherein n is greater than 10; (b) a drug selected from the group consisting of locally and systemically acting pharmaceutically acceptable drugs present in the matrix; and, (c) wherein the device when in operation bioerodes at a controlled and continuous rate over a prolonged period of time, thereby administering a therapeutically effective amount of drug to the animal at a controlled and continuous rate over a prolonged period of time.

4,093,710
RAPID DISSOLVING EFFERVESCENT GRANULES

Robert N. Sass, Greenwood, and Chwang Tek Wie, Lincoln, both of Nebr., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Jul. 7, 1976, Ser. No. 703,255
Int. Cl.[2] A61L *9/04*
U.S. Cl. 424—44 **16 Claims**

1. A method of preparing stable, free flowing, rapid dissolving, palatable effervescent granules having essentially the following composition per unit dose:

Active ingredient suitable for administration orally in an effervescent drink	Therapeutically effective amount
Alkali metal carbonate or bicarbonate	0.200 Gm. - 2.000 Gm.
Organic Acid, Anhydrous granule	0.200 Gm. - 2.000 Gm.
Sweetener	0.005 Gm. - 0.100 Gm.
Surfactant	0.002 Gm. - 0.070 Gm.
Flavor	q.s.

which comprises:

(a) grinding the active ingredients, alkali metal carbonate, and sweetener to a mesh size of less than 80;

(b) mixing the active ingredient, alkali metal carbonate, and sweetener in a mixer to form a uniform mixture and granulating the mixture with a 1 percent to 25 percent by weight solution of the surfactant in water to form fine granules having a mesh size between #10 and #80;

(c) drying the granules at a temperature between 65° F. and 200° F. to a moisture level of less than 0.5 percent;

(d) sizing the granulation by grinding and screening to obtain particles having a particle size of less than 20 mesh;

(e) sizing the organic acid to obtain particles having a particle size of less than 20 mesh;

(f) milling the flavors to a particle size of less than 80 mesh; and

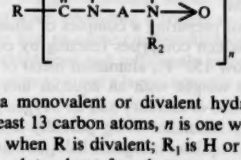
(g) blending the granulation of Step (d) with the acid and flavors of Steps (e) and (f) to obtain a uniform granule mixture.

4,093,711
ORAL HYGIENE

Owen Rodney Blackburne, Baltimore, and Warren B. Shapiro, Randallstown, both of Md., assignors to Noxell Corporation, Baltimore, Md.

Filed Aug. 13, 1976, Ser. No. 714,149
Int. Cl.[2] N61K *7/22*
U.S. Cl. 424—54 **35 Claims**

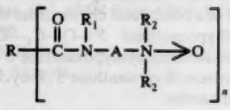
1. A method for retarding pellicle and plaque formation which comprises intermittently contacting sites of plaque formation and growth with a preparation comprising an amount sufficient to retard pellicle and plaque formation of at least one compound of the formula:



wherein R is a monovalent or divalent hydrocarbyl group containing at least 13 carbon atoms, n is one when R is monovalent and is 2 when R is divalent; R_1 is H or an alkyl group containing from 1 to about 3 carbon atoms; A is a divalent hydrocarbon bridge containing from 1 to about 6 carbon atoms; and each R_2 individually is an alkyl group containing

from 1 to about 5 carbon atoms; or both R_2 groups are interconnected to form a heterocyclic ring with the N atom to which they are attached and contain 5 to 6 members in the ring; and wherein said heterocyclic ring is selected from the group consisting of morpholinyl, piperidinyl, pyrrolidinyl, and piperazinyl.

30. A dental preparation retarding pellicle and plaque formation which comprises an amount sufficient to retard pellicle and plaque formation of at least one compound of the formula:



wherein R is a monovalent or divalent hydrocarbon group containing at least 13 carbon atoms, *n* is one when R is monovalent and is 2 when R is divalent, R_1 is H or an alkyl group containing from 1 to about 3 carbon atoms, A is a divalent hydrocarbon bridge containing from 1 to about 6 carbon atoms, each R_2 individually is an alkyl group containing from 1 to about 5 carbon atoms, or both R_2 groups are interconnected to form a heterocyclic ring with the N atom to which they are attached and contain 5 to 6 members in the ring, and being selected from the group consisting of morpholinyl, piperidinyl, pyrrolidinyl, and piperazinyl; from about 5 to about 50% by weight of an abrasive polishing agent; from about 0.5 to about 5% by weight of a sudsing agent; from about 0.1 to about 15% by weight of a thickening agent; and water.

4,093,712

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 638,985, Dec. 9, 1975, Pat. No. 4,055,636, Ser. No. 646,522, Jan. 5, 1976, Pat. No. 4,018,915, Ser. No. 649,219, Jan. 14, 1976, Pat. No. 4,018,913, Ser. No. 656,014, Feb. 6, 1976, Pat. No. 4,041,156, Ser. No. 656,870, Feb. 10, 1976, Pat. No. 4,046,876, Ser. No. 669,743, Mar. 24, 1976, Ser. No. 671,436, Mar. 29, 1976, and Ser. No. 703,704, Jul. 8, 1976, said Ser. No. 671,436, is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,672

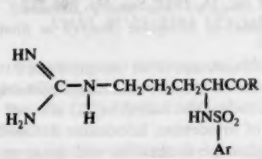
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

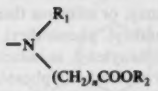
U.S. Cl. 424—177 **3 Claims**

1. An N^2-arylsulfonyl-L-argininamide having the formula (I):



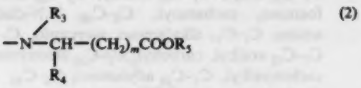
(I)

or a pharmaceutically acceptable salt thereof, wherein R is



(1)

wherein R_1 is C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl or C_4–C_{10} cycloalkylalkyl; R_2 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *n* is an integer of 1, 2 or 3; or



(2)

wherein

R_3 is hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkyltioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl or C_4–C_{10} cycloalkylalkyl; R_4 is C_1–C_5 alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_5 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *m* is an integer of 0, 1 or 2;

Ar is a phenyl or naphthyl group, either substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxy, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof,

a phenyl or naphthyl group, either substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxy, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof,

and at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino;

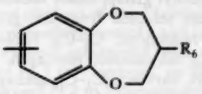
an oxanthrenyl or dibenzofuranyl group substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof,

a C_7–C_{12} aralkyl, tetrahydronaphthyl, 1,2-ethylenedioxyphenyl, chromanyl, 2,3-ethylenedioxynaphthyl or xanthenyl group, any substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl,

oxo and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof;

a naphthoquinonyl, anthryl, phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, as-indacenyl, S-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofuranyl, isobenzofuranyl, benzo [b] thienyl, isobenzothienyl, thianthrenyl, dibenzothienyl, phenoxathiinyl, indolyl, 1H-indazolyl, quinolyl, isoquinolyl, phthalazinyl, 1,8-naphthridinyl, quinoxalinyl, quinazolinyl, cinnolinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, phenoxazinyl or benzimidazolyl group any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof;

9,10-dihydroanthryl, 5,6,7,8-tetrahydroanthryl, 9,10-dihydrophenanthryl, 1,2,3,4,5,6,7,8-octahydrophenanthryl, indenyl, indanyl, fluorenyl, acenaphthenyl, phenylthiophenyl, isochromanyl, 2,3-dihydrobenzofuranyl, 1,3-dihydroisobenzofuranyl, thioxanthenyl, 2H-chromenyl, 3,4-dehydro-1-isochromanyl, 4H-chromenyl, indolinyl, isoindolinyl, 1,2,3,4-tetrahydroquinolyl or 1,2,3,4-tetrahydroisoquinolyl group any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof; or benzene ring-substituted



wherein R_6 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy, and said substituent is at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof.

4,093,713

DIPEPTIDE DERIVATIVES WITH CENTRAL NERVOUS SYSTEM ACTIVITY AND PREPARATION THEREOF

Kazimir Sestanj, Pointe Claire; Hans Ueli Immer, Mount Royal, and Manfred Karl Gotz, Hudson, all of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

Filed Feb. 28, 1977, Ser. No. 772,389
Int. Cl.[2] A61K *37/00*
U.S. Cl. 424—177 **18 Claims**

1. A compound of formula I

H—L—Pro—N(R^1)CH(R^2)CO—NHR^3 (I)

in which R^1, R^2 and R^3 each independently is lower alkyl, or a therapeutically acceptable acid addition salt thereof.

16. A pharmaceutical composition in unit dosage form for treating Parkinson's disease comprising a combination of a compound of formula I of claim 1, or a therapeutically acceptable acid addition salt thereof, together with a therapeutic dose of levodopa and a pharmaceutically acceptable carrier.

4,093,714

9β-D-ARABINOFURANOSYLPURINE NUCLEOTIDES AND METHOD OF USE

Richard L. Tolman, Berkley Heights, N.J.; Robert W. Sidwell, Irvine, and Ganapathi R. Revankar, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 342,617, Mar. 19, 1975, abandoned. This application Mar. 15, 1974, Ser. No. 451,639
Int. Cl.[2] A61K *31/52*; C07H *19/20*; A61K *31/70*
U.S. Cl. 424—180 **14 Claims**

12. An antiviral composition for the treatment of DNA virus-caused infections containing as its active ingredient an effective amount of a compound chosen from the group 9-β-D-arabinofuranosylhypoxanthine 5′—O—C_1—C_6 alkyl phosphate, 9-β-D-arabinofuranosylhypoxanthine 3′-phosphate, and 9-β-D-arabinofuranosylhypoxanthine 3′,5′-cyclic phosphate in a pharmaceutical carrier.

4,093,715

5-IODO-5′-AMINO-2′,5′-DIDEOXYCYTIDINE AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Tai-Shun Lin, North Haven; H. William Prusoff, Branford, and David C. Ward, Guilford, all of Conn., assignors to Research Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 792,011
Int. Cl.[2] A61K *31/70*; C07H *19/06*
U.S. Cl. 424—180 **7 Claims**

5. A pharmaceutical composition containing an effective amount of a compound for treating herpes simplex virus infection in mammals, said compound being selected from the group consisting of 5-iodo-5′-amino-2′,5′-dideoxycytidine and the pharmaceutically acceptable acid addition salts thereof together with a pharmaceutically acceptable carrier.

4,093,716

COMPOSITIONS CONTAINING 5-AMINO-5-DEOXYTHYMIDINE AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Tai-Shun Lin, North Haven; H. William Prusoff, Branford, and David C. Ward, Guilford, all of Conn., assignors to Research Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 792,047
Int. Cl.[2] A61K *31/70*; C07H *19/06*
U.S. Cl. 424—180 **4 Claims**

1. A pharmaceutical composition containing an effective amount of a compound for treating herpes simplex virus infection in mammals, said compound being selected from the group consisting of 5′-amino-5′-deoxythymidine and the pharmaceutically acceptable acid addition salts thereof together with a pharmaceutically acceptable carrier.

4,093,717

ANTIMICROBIAL COMPOSITIONS

Charles D. Hufford, Oxford, Miss., assignor to University of Mississippi, University, Miss.

Filed Jul. 16, 1975, Ser. No. 596,282
Int. Cl.[2] A61K *35/78, 31/47*
U.S. Cl. 424—195 **7 Claims**

1. An antimicrobial composition comprising a compound or mixture of compounds derived from an alcoholic extract of the heartwood of *Liriodendron tulipifera L.* selected from the group consisting of liriodenine, liriodenine methiodide, dehydroglaucine, oxoglaucine methiodide and mixtures thereof in admixture with a non-toxic pharmaceutically acceptable carrier in a therapeutically effective concentration.

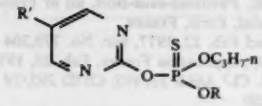
4,093,718

O,O-DIALKYL-5-HALO-PYRIMIDIN(2) YL-THIONOPHOSPHORIC ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Steinenbrueck, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 6, 1976, Ser. No. 656,041
Claims priority, application Germany, Feb. 22, 1975, 2507702
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] A01N *9/36*; C07F *9/56*
U.S. Cl. 424—200 8 Claims

1. An O,O-dialkyl-5-halo-pyrimidin(2)yl-thionophosphoric acid ester of the formula



in which

R is methyl or ethyl and

R′ is chlorine or bromine.

6. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

7. A method of combatting insects or acarids which comprises applying to the insects or acarids or to a habitat thereof an insecticidally or acaricidally effective amount of a compound according to claim 1.

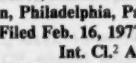
4,093,719

ANTIARTHRITIC COMPOSITIONS COMPRISING BIS[(TRIALKYL-PHOSPHINE)GOLD(I)]SULFIDES AND METHODS OF PRODUCING ANTIARTHRITIC ACTIVITY

David Taylor Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 16, 1977, Ser. No. 769,245
Int. Cl.[2] A61K *31/66*
U.S. Cl. 424—215 4 Claims

1. A pharmaceutical composition having antiarthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective, nontoxic amount of a bis[(trialkylphosphine)-gold(I)]sulfide of the formula:



in which:

R is lower alkyl being straight or branched chain of from one to four carbons.

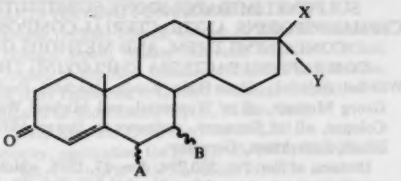
4,093,720

NOVEL-17-SPIROSULTINES THEIR CORRESPONDING HYDROXY ACIDS AND COMPOSITIONS THEREOF

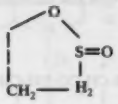
Genevieve Rousseau, Paris, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 14, 1977, Ser. No. 776,942
Claims priority, application France, Mar. 16, 1976, 76 07476
Int. Cl. C07j *33/00, 21/00*; A61k *31/58*
U.S. Cl. 424—241 15 Claims

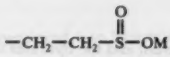
1. A compound selected from the group consisting of 17-spirosultines and their corresponding γ-hydroxy acids of the formula



wherein A is hydrogen and B is alkyl of 1 to 4 carbon atoms in the α- or β-position or A and B form a methylene group in the 6α, 7α- or 6β, 7β-position and X and Y form a group of the formula



or X is OH and Y is



and M is selected from the group consisting of hydrogen, $-NH_4$ and an alkali metal cation.

14. A method of relieving hypertension and cardiac insufficiencies in warm-blooded animals comprising administering to warm-blooded animals a hypotensively effective amount of at least one compound of claim 1.

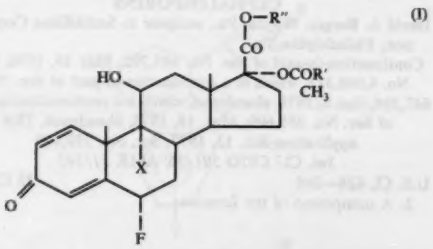
4,093,721

PHARMACEUTICAL COMPOSITIONS OF 6α,9α-DIFLUORO-ANDROST-4-ENE-17β-CARBOXYLATES AND DERIVATIVES THEREOF

Gordon H. Phillipps, Wembley, and Brian M. Bain, Chalfont St. Peter, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 609,043, Aug. 29, 1975, abandoned.
This application Jan. 6, 1977, Ser. No. 757,325
Claims priority, application United Kingdom, Aug. 30, 1974, 38090/74
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 13 Claims

1. Compounds of the general formula



(I)

wherein X represents a hydrogen or fluorine atom, R′ represents a methyl, ethyl, n-propyl or iso-propyl group, R″ represents a methyl, chloromethyl, fluoromethyl, bromomethyl or 2-fluoroethyl group and represents a single or double bond.

7. Pharmaceutical compositions comprising, as active ingredient, at least one compound of claim 1 together with at least one pharmaceutical carrier or excipient.

4,093,722
SULFONYLIMIDAZOLIDONE SUBSTITUTED CEPHALOSPORINS, ANTIBACTERIAL COMPOSITIONS CONTAINING THEM, AND METHODS OF COMBATTING BACTERIA EMPLOYING THEM

Wilfried Schröck; Hans-Bodo Konig; Michael Preiss; Karl Georg Metzger, all of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

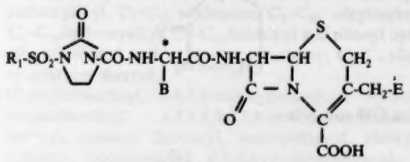
Division of Ser. No. 590,794, Jun. 27, 1975, which is a continuation-in-part of Ser. No. 548,347, Feb. 10, 1975, abandoned. This application May 13, 1976, Ser. No. 686,103

Claims priority, application Germany, Feb. 18, 1974, 2407715

Int. Cl.[2] A61K *31/545;* **C07D** *501/34, 501/24*

U.S. Cl. 424—246 **16 Claims**

1. A compound selected from the group consisting of a cephalosporin derivative of the formula



the nontoxic salts thereof and the hydrates thereof wherein the carbon atom designated•constitutes a center of chirality;

E is hydrogen; hydroxy; or acetoxy;

B is phenyl; methylphenyl; chlorophenyl; hydroxyphenyl or cyclohexa-1,4-dien-1-yl; and

R_1 is thienyl; furyl; piperidyl; pyrrolidyl; amino; alkylamino of 1 to 4 carbon atoms in each alkyl group; phenyl; naphthyl; or phenyl or naphthyl substituted by one to five substituents selected from the group consisting of halo, cyano, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and alkylsulfamyl of 1 to 4 carbon atoms; or $NC—CH_2—$.

10. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially-effective amount of a compound of claim 1 in combination with a pharmaceutically acceptable nontoxic, inert diluent or carrier.

11. A method of treating bacterial infections in humans and animals which comprises administering to such human or animal an antibacterially-effective amount of a compound of claim 1.

4,093,723
7-ACYL-3-(SULFONIC ACID AND SULFAMOYL SUBSTITUTED TETRAZOLYL THIOMETHYL) CEPHALOSPORINS

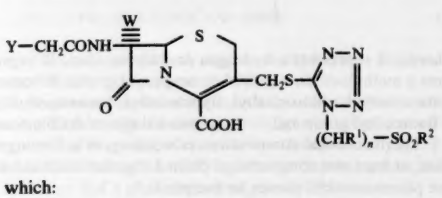
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 687,792, May 19, 1976, Pat. No. 4,048,311, which is a continuation-in-part of Ser. No. 647,394, Jan. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 559,609, Mar. 18, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,160

Int. Cl.[2] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 424—246 **23 Claims**

1. A compound of the formula:



in which:

W is hydrogen or methoxy;

each individual R^1 is hydrogen or lower alkyl;

n is one to ten;

R^2 is hydroxy, amino, lower alkylamino or di(lower)alkylamino; and

Y is thienyl, tetrazolyl, cyano, sydnone or aminomethylphenyl,

or a non-toxic pharmaceutically acceptable salt thereof.

16. An antibacterial pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,093,724
NOVEL-3-(4-QUINOLYLAMINO)-2-THIOPHENE-CARBOXYLATES

André Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 22, 1977, Ser. No. 770,304

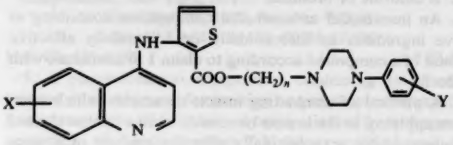
Claims priority, application France, Feb. 23, 1976, 76 04918

Int. Cl.[2] A61K *31/495;* **C07D** *295/14*

U.S. Cl. 424—250 **20 Claims**

1. A compound selected from the group consisting of 3-(4-quinolylamino)-2-thiophene-carboxylate of the formula

I



wherein X is in the 6,7 or 8-position and is selected from the group consisting of hydrogen, halogen, $—CF_3$ and alkyl and alkoxy of 1 to 8 carbon atoms, *n* is 2,3,4 or 5, Y is in the 2,3 or 4-position and is selected from the group consisting of hydrogen, halogen, $—CF_3$ and alkyl and alkoxy of 1 to 8 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

11. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,093,725
(3-ALKYLAMINO-2-HYDROXYPROPOXY)-1-HYDRAZINOPHTHALAZINES

Anthony Maitland Roe, Hatfield; Robert Anthony Slater, Letchworth, and Edwin Michael Taylor, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

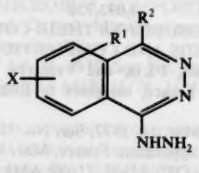
Filed Jan. 31, 1977, Ser. No. 763,946

Claims priority, application United Kingdom, Feb. 9, 1976, 04896/76

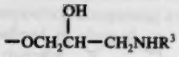
Int. Cl.[2] A61K *31/50;* **C07D** *237/34*

U.S. Cl. 424—250 **12 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen, lower alkyl, halogen, lower alkoxy or di lower alkylamino; R^2 is hydrogen, methyl, halogen, benzyl, chlorobenzyl or methoxybenzyl; and X is a group of the formula



wherein R^3 is isopropyl, t-butyl or phenylethyl; or a pharmaceutically acceptable acid addition salt thereof.

8. A pharmaceutical composition having β-adrenergic blocking and vasodilator activity comprising in an effective amount to produce β-adrenergic blocking and vasodilator activity a compound of claim 1 in combination with a pharmaceutically acceptable diluent or carrier.

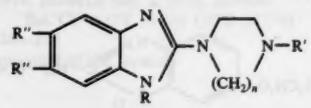
4,093,726

N-(2-BENZIMIDAZOLYL)-PIPERAZINES

Martin Winn, Deerfield, and Jaroslav Kyncl, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 2, 1976, Ser. No. 746,657
Int. Cl.[2] C07D *401/04;* A61K *31/495*
U.S. Cl. 424—250 **13 Claims**

1. A compound of the formula:

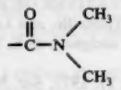


wherein:

n is 2;

R is selected from the group consisting of hydrogen or methyl;

R′ is C_1-C_6 alkyl, 4-methyl valeroyl, phenyl, dimethoxyphenyl, CF_3-phenyl, tetrahydrofuroyl, Furoyl,



or C_2-C_4 alkoxy carbonyl and

R″ is selected from the group consisting of hydrogen or methoxy.

6. An antihypertensive pharmaceutical composition comprising a compound selected from the group consisting of 1-(5,6-Dimethoxy-2-benzimidazolyl)-4-(2-furoyl) piperazine, 4-(5,6-Dimethoxy-2-benzimidazolyl) piperazine-1-carboxylic ethyl ester, 1-(5,6-Dimethoxy-1-methyl-2-benzimidazolyl)-4-(2-furoyl) piperazine, 1-(5,6-Dimethoxy-2-benzimidazolyl)-4 (tetrahydro-2-furoyl) piperazine, 4-(5,6-Dimethoxy-2-benzimidazolyl) piperazine-1-carboxylic acid isobutyl ester, N,N-Dimethyl 4-(5,6-dimethoxy-2-benzimidazolyl) piperazine-1-carboxamide, 1-(5,6-Dimethoxy-2-benzimidazolyl)-4(3,4-dimethoxy-phenyl) piperazine, N (4-methyl valeroyl) piperazine, 1-(5,6-Dimethoxy-2-benzimidazolyl)-4(4-methylvaleroyl) piperazine, 1-(5,6-Dimethoxy-2-benzimidazolyl)-4(3-trifluoromethyl phenyl) piperazine, 1-methyl 4(2-benzimidazolyl) piperazine and pharmaceutically acceptable acid addition salts thereof and a pharmaceutically acceptable carrier.

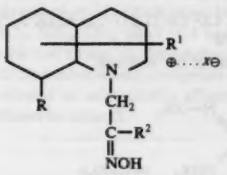
4,093,727

ALPHA-HYDROXYIMINO-ALKYLQUINOLINIUM SALTS HAVING FUNGICIDE ACTION

Luigi Abbruzzese, Milan; Franco Gozzo, S. Donato Milanese (Milan); Giorgio Rossi, Milan; Marcella Masoero, Milan; Simone Lorusso, S. Giuliano Milanese (Milan); Paola Bonola, Milan, and Gino Tamburin, S. Donato Milanese (Milan), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 15, 1976, Ser. No. 677,247
Claims priority, application Italy, Apr. 15, 1975, 22346 A/75
Int. Cl.[2] C07D *215/10;* A61K *31/47*
U.S. Cl. 424—258 **13 Claims**

1. Alpha-hydroxyimino-akylquinolinium salts of the formula



wherein:

R is H or OH;

R^1 is H or alkyl containing 1 to 5 carbon atoms;

R^2 is CN;

in which R^3 is alkyl containing 1 to 5 carbon atoms or phenyl; selected from the group consisting of Cl, Br and I.

13. The method of combatting or preventing fungine infections of plants by *Botrytis cinerea, Sphaerotheca fuliginea* and *Fusicladium dendriticum*, which comprises applying to the plants to be protected powders, suspensions or solutions of the compounds of claim 1, in an amount of at least 15 micrograms per sq. cm of foliar surface.

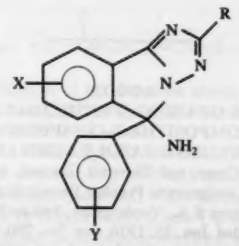
4,093,728

TRIAZOLOISOINDOLES

Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 18, 1977, Ser. No. 825,640
Int. Cl.[2] A61K *31/41;* C07D *487/04*
U.S. Cl. 424—269 **10 Claims**

1. A compound of the structure



wherein X is hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl or nitro; Y is hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl or nitro; and R is hydrogen, lower alkyl or trifluoromethyl.

8. A pharmaceutical composition for treating inflammatory conditions in mammals or treating or preventing helminthiasis in mammals comprising a compound of claim 1 in an amount

effective for such purposes and a physiologically acceptable carrier therefor.

4,093,729

N-OXY AND N-AMINO GUANIDINES

Graham John Durant; Charon Robin Ganellin, and Geoffrey Robert Owen, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

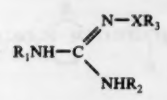
Division of Ser. No. 585,898, Jun. 11, 1975, Pat. No. 4,034,101. This application Apr. 11, 1977, Ser. No. 786,729

Claims priority, application United Kingdom, Jun. 28, 1974, 28722/74

Int. Cl.[2] C07D *277/22;* A61K *31/425*

U.S. Cl. 424—270 **11 Claims**

1. A compound of the formula:



FORMULA I

wherein R_1 represents a grouping of the structure shown in the formula:

$$\text{Het} - (CH_2)_m Z (CH_2)_n$$

FORMULA II

wherein Het is thiazole, isothiazole, oxazole or isoxazole, which is optionally substituted by lower alkyl, chlorine or bromine; Z is sulphur or a methylene group; *m* is 0, 1 or 2 and *n* is 2 or 3 provided that the sum of *m* and *n* is 3 or 4; R_2 is hydrogen, lower alkyl or a grouping of the structure shown in Formula II wherein Het, *m*, *n* and Z are as defined above; X is oxygen or when R_2 is a grouping of the structure shown in Formula II, X may be NH; and R_3 is hydrogen, lower alkyl, phenyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

9. A pharmaceutical composition to block histamine H_2-receptors comprising a pharmaceutically acceptable diluent or carrier and, in an effective amount to block histamine H_2-receptors, a compound of claim 1.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal in need of blocking of histamine H_2-receptors in an effective amount to block histamine H_2-receptors a compound of claim 1.

11. A method of inhibiting gastric acid secretion which comprises administering to an animal in need thereof in an effective amount to inhibit gastric acid secretion a compound of claim 1.

4,093,730

METHODS OF USING SPERMICIDAL VAGINAL COMPOSITIONS COMPRISING 1,2-BENZISOTHIAZOLE DERIVATIVES

Adriano Butti, Como, and Giovanni Gazzani, Appiano Gentile, both of Italy, assignors to Prephar Prospection de Recherches Pharmaceutiques S.A., Vordergasse, Switzerland

Filed Jun. 28, 1976, Ser. No. 700,115

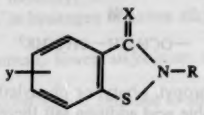
Claims priority, application Italy, Jul. 3, 1975, 25051 A/75

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 **15 Claims**

1. A method of contraception, comprising;

administering to a disease free human vagina immediately prior to coitus a spermatocidally effective amount of a 1,2-benzisothiazole derivative having the general formula



wherein:

X is either O or S;

y is H, NO_2, a halogen atom or an alkyl radical having 1–4 carbon atoms; and

R is H; a straight or branched alkyl or alkenyl radical having from 1–6 carbon atoms, optionally substituted by one or more hydroxyl or tertiary amino groups; a cycloaliphatic radical having from 3 to 8 carbon atoms; a phenyl radical, optionally substituted by halogen atoms or methoxy radicals; a benzyl or phenylethyl radical; or an acyl radical, —COR[1], wherein R^1 is an alkyl group having from 1 to 4 carbon atoms or a phenyl radical.

4,093,731

METHYL-6-N-PROPOXYBENZOTHIAZOLE-2-CARBAMATE AND ANTHELMINTIC PHARMACEUTICAL COMPOSITIONS THEREOF

Mohammed Mehdi Nafissi-Varchei, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Mar. 7, 1977, Ser. No. 775,006

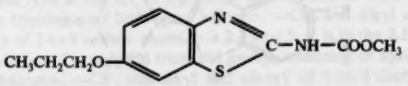
Claims priority, application Denmark, Mar. 30, 1976, 1460/76

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] C07D *277/82*

U.S. Cl. 424—270 **4 Claims**

1. A compound of the formula



2. A pharmaceutical composition useful for the treatment of helminthiasis in mammals which comprises an anthelmintically effective amount of the compound of claim 1 in admixture with a suitable pharmaceutical carrier.

4,093,732

SULFOXIDE DERIVATIVES OF BENZIMIDAZOLES

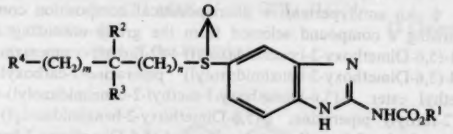
Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 17, 1977, Ser. No. 769,634

Int. Cl.[2] C07D *235/32;* A61K *31/415*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the structure



wherein R^1 is lower alkyl containing 1 to 7 carbons or phenyl-lower alkyl containing 1 to 7 carbons in the alkyl group, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen or lower alkyl containing 1 to 7 carbons, and R^4 is selected from the group consisting of halocycloalkyl containing 3 to 12 carbons or cycloalkenyl containing 3 to 10 carbons optionally substituted with alkyl containing 1 to 7 carbons or halo, *m* is 0 to 3, *n* is 0 to 3 and $m + n \leqq 5$.

9. A method for treating helminthiasis which comprises

administering to a mammalian host an effective amount of a pharmaceutical composition comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,093,733

PARENTERAL SUSPENSIONS

Joel B. Portnoff, Philadelphia, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 9, 1976, Ser. No. 721,921
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **2 Claims**

1. A parenteral suspension composition comprising 25 mg./ml. of total suspension of a medicament composition comprising 1-(p-chlorobenzoyl)-2-methyl-5-methoxy-3-indolyl acetic acid; 0.10 to 0.20 mg./ml. of total suspension of a deflocculating agent comprising polyoxyethylene (20) sorbitan monooleate; 9 to 12 mg./ml. of total suspension of a flocculating agent comprising benzyl alcohol; and water.

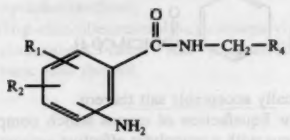
4,093,734

AMINO-BENZOIC ACID AMIDES

Gerd Krüger; Johannes Keck, both of Biberach; Klaus Reinhold Noll, Warthausen; Helmut Pieper, Biberach; Harald Ziegler, Biberach; Helmut Ballhause, Biberach, and Joachim Kähling, Biberach, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Oct. 22, 1976, Ser. No. 734,818
Claims priority, application Germany, Nov. 3, 1975, 2548968; Aug. 10, 1976, 2635873; Sep. 3, 1976, 2639645
Int. Cl.[2] A61K *31/40*; C07D *207/44*
U.S. Cl. 424—274 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, chlorine or bromine,

R_2 is methyl, fluorine, chlorine, bromine, trifluoromethyl or nitro, and

R_4 is 1-(alkyl of 1 to 3 carbon atoms)-pyrrolidinyl (2),

or a non-toxic, phamacologically acceptable acid addition salt thereof.

6. An anxiolytic or anticonvulsive pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective amount of a compound of claim 1.

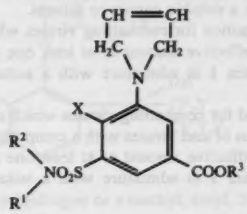
4,093,735

5-SULFAMOYLBENZOIC ACID DERIVATIVES CARRYING A HETEROCYCLIC SUBSTITUENT

Dieter Bormann, Kelkheim, Taunus; Wulf Merkel, Neuenhain, Taunus, and Roman Muschaweck, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 570,649, Apr. 23, 1975, Pat. No. 4,010,273. This application Nov. 10, 1976, Ser. No. 740,741
Claims priority, application Germany, Apr. 25, 1974, 2419970
Int. Cl.[2] C07D *207/20*
U.S. Cl. 424—274 **4 Claims**

1. A compound of the formula



and the physiologically tolerated salts thereof, wherein R^1, R^2, and R^3 are hydrogen or alkyl of 1 to 4 carbon atoms; and X is phenoxy, the phenyl ring of which may be substituted by halogen, OH, NO_2, NH_2, CF_3, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, or dimethylamino.

4. A method of treatment which comprises administering to a patient a diuretically or saluretically effective amount of a compound as defined in claim 1.

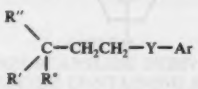
4,093,736

METHYLENEDIOXYPHENYL SUBSTITUTED ALIPHATIC DIKETONES

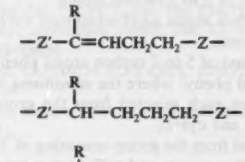
Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.

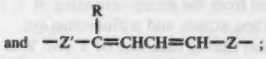
Continuation-in-part of Ser. No. 545,486, Jan. 30, 1975, which is a continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, which is a continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Nov. 10, 1976, Ser. No. 740,358
Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73
Int. Cl.[2] A01N *9/28*; A61K *31/36*; C07D *317/44*
U.S. Cl. 424—282 **22 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of



and  ;

R′ is lower-alkanoyl of 2 to 6 carbon atoms;

R″ is lower-alkanoyl of 2 to 6 carbon atoms or carbo-lower-alkoxy of 2 to 6 carbon atoms;

R^0 is hydrogen, lower-alkyl of 1 to 4 carbon atoms or chloro;

R is hydrogen or lower-alkyl of 1 to 4 carbon atoms;

Z is a single bond, vinylene only when the remainder of Y is unsaturated, or ethylene only when Y is saturated;

Z′ is a single bond, methylene or ethylene; and

Ar is 3,4-methylenedioxyphenyl.

19. A composition for combatting arthropods by hindering their maturation which comprises an anti-maturation effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

20. A method for combatting arthropods by hindering their maturation which comprises treating said arthropods at any stage of their development with an anti-maturation effective

amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

21. A composition for combatting viruses which comprises an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

22. A method for combatting viruses which comprises contacting the locus of said viruses with a composition containing an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

4,093,737

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF IN THE TREATMENT OF PAIN, FEVER OR INFLAMMATION

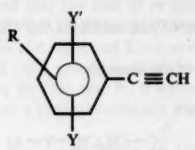
Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Jan. 11, 1977, Ser. No. 758,459

Int. Cl.² A61K *31/275;* **C07C** *120/50*

U.S. Cl. 424—304 **14 Claims**

1. A method of treating inflammation, pain or fever in a warm blooded animal which comprises administering to the animal an effective amount of an active agent which is a compound of the formula:



where

R is hydrogen,
alkyl of 1 to 7 carbon atoms,
cycloalkyl of 5 to 7 carbon atoms,
1 to 7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms,
cycloalkenyl of 5 to 7 carbon atoms phenyl or substituted phenyl where the substituent is Y'';

Y and Y' are each selected from the group consisting of hydrogen and cyano;

Y'' is selected from the group consisting of Y, lower alkyl of 1 to 7 carbon atoms, and trifluoromethyl,

with the proviso that at least one of Y and Y' is cyano.

4,093,738

MICROBICIDALLY-ACTIVE ACYLATED ANILINO-CARBOXYLIC ACID ESTERS AND THEIR COMPOSITIONS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

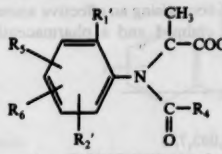
Continuation-in-part of Ser. No. 564,016, Apr. 1, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,825

Claims priority, application Switzerland, Apr. 9, 1974, 4998/74; Mar. 7, 1975, 2906/75

Int. Cl.² A61K *31/24;* **C07C** *101/18*

U.S. Cl. 424—309 **16 Claims**

1. A compound of the formula Ia



Ia

wherein

R_1' represents methyl

R_2' represents methyl, ethyl or chlorine

R_5 represents hydrogen, alkyl of 1 to 3 carbon atoms or halogen and

R_6 represents hydrogen or methyl; the total number of carbon atoms in R_1', R_2', R_5, R_6 not exceeding 4;

R_3' represents methyl and

R_4 represents alkyl of 2 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or cycloalkyl of 3 to 4 carbon atoms.

9. A microbicidal composition containing as active substance an effective amount of a compound as claimed in claim 1, together with a suitable carrier therefor.

4,093,739

MERCAPTOACYLAMIDOBENZOYL GLYCINE AND MUCOLYTIC PROCESS

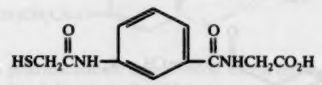
Tellis Alexander Martin, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Jun. 15, 1977, Ser. No. 806,877

Int. Cl.² A61K *31/205;* **C07C** *149/00*

U.S. Cl. 424—316 **19 Claims**

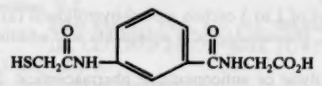
1. A compound selected from the group consisting of N-[3-(mercaptoacetylamino)benzoyl]glycine characterized by formula I



(I)

and a pharmaceutically acceptable salt thereof.

12. A process for liquefaction of mucus which comprises contacting said mucus with a mucolytic effective amount of a compound selected from the group consisting of N-[3-(mercaptoacetylamino)benzoyl]glycine characterized by Formula I



(I)

and a pharmaceutically acceptable salt thereof.

4,093,740

FODDER FOR RUMINANTS

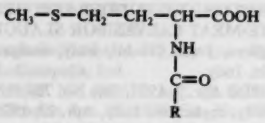
Rudolf Fahnenstich, Strotzbach; Joachim Heese, Grossauheim, both of Germany, and Dyfed Lewis, Loughborough, England, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Feb. 16, 1973, Ser. No. 330,110

Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **4 Claims**

1. A process of feeding sheep having a paunch containing a microflora of bacteria and protozoa which normally break down added synthetic aminoacids comprising feeding them fodder which goes to the paunch, said fodder containing an N-acyl-methionine of the formula



where R is an aliphatic hydrocarbon having 7 to 19 carbon atoms as a source of methionine which is not broken down in said paunch, the N-acyl-methionine being present in an amount effective to increase the growth of wool on sheep.

4,093,741
PROCESS FOR REDUCING BLOOD SUGAR CONCENTRATION IN A MAMMAL

Frederick A. Grunwald, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 604,971, Aug. 15, 1975, Pat. No. 3,998,879, which is a division of Ser. No. 478,497, Jun. 12, 1974, Pat. No. 3,917,692. This application Oct. 20, 1976, Ser. No. 734,154

Int. Cl.[2] A61K *31/18*

U.S. Cl. 424—321 **6 Claims**

1. A process for reducing blood sugar concentration in a mammal which comprises administering to a mammal requiring blood sugar reduction an effective amount ranging from 3 to 200 mg./kg. body weight of said mammmal to exert a blood sugar reducing effect of a compound selected from the group consisting of

5,5-dimethyl-2-(N-p-toluenesulfonylcarbamoyl)-1,3-cyclohexanedione;

5-ethyl-2-(N-p-toluenesulfonylcarbamoyl)-1,3-cyclohexanedione;

5-isopropyl-2-(N-p-toluenesulfonylcarbamoyl)-1,3-cyclohexanedione;

5-tert.-butyl-2-(N-p-toluenesulfonylcarbamoyl)-1,3-cyclohexanedione;

2-(N-p-chlorobenzenesulfonylcarbamoyl)-5,5-dimethylcyclohexane-1,3-dione and pharmaceutically acceptable basic salts thereof.

4,093,742
ANTI-HYPERTENSIVE POLYHALOISOPROPYL-SUBSTITUTED ARYLUREAS

Bernard R. Neustadt, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

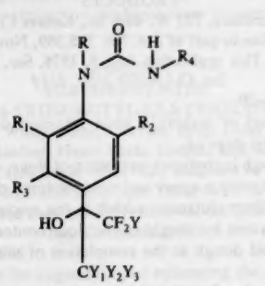
Continuation-in-part of Ser. No. 528,603, Dec. 2, 1974, abandoned. This application May 4, 1976, Ser. No. 683,104

Claims priority, application Switzerland, Nov. 21, 1975, 15164/75

Int. Cl.[2] A61K *31/17*; C07C *127/19*

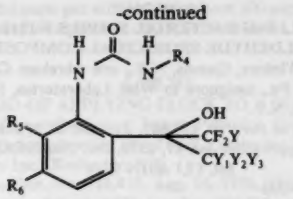
U.S. Cl. 424—322 **20 Claims**

1. A compound of the formula:



(Ia)

-continued



(Ib)

wherein R_4 is hydrogen or a methyl, ethyl, 2-chloroethyl or a 2-bromoethyl group;

R_1, R_2 and R_3 are independently hydrogen, fluorine, chlorine, bromine, aminocarbonyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, hydroxy lower alkyl or nitro;

Y, Y_1, Y_2 and Y_3 are independently hydrogen, fluorine or chlorine;

R is hydrogen, alkyl having 1 to 4 carbon atoms, lower alkoxy lower alkyl or lower dialkoxy lower alkyl;

R_5 and R_6 are hydrogen or a lower alkyl group or R_5 and R_6 together complete a 5 or 6 carbon fused hydrocarbon ring which may be saturated or aromatic and which may be optionally substituted by a lower alkyl group.

16. A pharmaceutical composition adapted to treat hypertension comprising an oral dosage form of an effective antihypertensive amount of a compound of claim 1, in a pharmaceutically acceptable diluent.

4,093,743
NOVEL BENZOIC ANILIDE DERIVATIVE AND FUNGICIDE CONTAINING SAME

Kunihiro Yabutani, Izumi; Kenichi Ikeda, Toyonaka; Shigenori Hatta, Sakai, and Tatsuo Harada, Kawachinagano, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

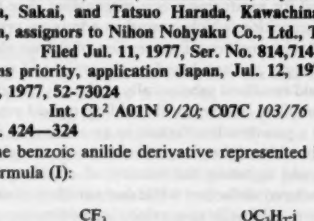
Filed Jul. 11, 1977, Ser. No. 814,714

Claims priority, application Japan, Jul. 12, 1976, 51-82711; Jun. 20, 1977, 52-73024

Int. Cl.[2] A01N *9/20*; C07C *103/76*

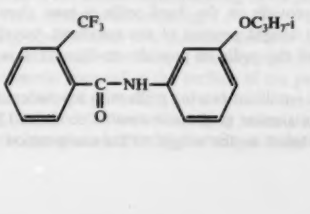
U.S. Cl. 424—324 **3 Claims**

1. The benzoic anilide derivative represented by the structural formula (I):



(I)

3. A method for controlling fungal diseases of agricultural and horticultural crops, which comprises applying to said crops a fungicidally effective amount of the compound represented by the structural formula (I),



(I)

4,093,744

KILLING BACTERIAL SPORES WITH GLUTARALDEHYDE SPORICIDAL COMPOSITIONS

Murray W. Winicov, Queens, N.Y., and Abraham Cantor, Elkins Park, Pa., assignors to West Laboratories, Inc., Long Island City, N.Y.

Continuation of Ser. No. 157,681, Jun. 28, 1971, abandoned. This application Jul. 17, 1975, Ser. No. 596,637
Int. Cl.[2] A01N 9/24
U.S. Cl. 424—333 3 Claims

1. A process for killing bacterial spores on medical appliances and apparatus which comprises immersing the same in a sporicidal composition comprising:

(a) a solvent consisting of water

(b) about 2 to 4% by weight glutaraldehyde, and

(c) 0.1 to 10% by weight of a surface active agent selected from the group consisting of the nonionic surface active agents which are alkylphenol ethoxylates, polyoxypropylene ethoxylates, butoxy derivatives of propylene oxide-ethylene oxide block polymers, and primary alkanol ethoxylates; the anionic surface active agents which are sulfated alcohols, sulfated alcohol ethoxylates, linear alkane sulfonates, and fluorinated anionic detergents; and the ampholytic surface active agent, disodium - N - lauryl - β - imino - dipropionate,

and being further characterized as having a pH of 7.0 $\pm$ 0.3.

4,093,745

METHOD FOR PRODUCING A PRILLED UREA BATH BEAD COMPOSITION

Donald C. Wood, Des Plaines, and Robert L. McLaughlin, Wilmette, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 635,282, Nov. 26, 1975. This application Jun. 25, 1976, Ser. No. 699,982
Int. Cl.[2] A61K 7/50
U.S. Cl. 424—358 15 Claims

1. A method for producing a non-segregating, free-flowing bath bead composition which comprises admixing urea prills with an oily liquid emollient in an amount of at least about 0.2 to about 10 weight percent, based on the weight of the prills, distributing said emollient substantially uniformly on said prills to provide emollient-bearing prills, adding to said emollient-bearing prills a powdered surfactant in an amount to provide about 1 to about 15 weight percent, based on the weight of the composition, and agitating the mixture of emollient-bearing prills and powdered surfactant while said emollient is absorbed or adsorbed into said prills to produce a free-flowing particulate composition in which the surfactant remains associated with the beads in a non-segregating fashion.

12. A method of producing a bath bead composition which comprises:

providing urea prills having moisture on the surface thereof in an amount sufficient to solubilize a water-soluble dye;

commingling said prills and a water-soluble dye to distribute said dye over the surface of said prills thereby producing dyed prills;

contacting the dyed prills with an absorbable liquid emollient to provide on the dyed prills at least about 0.2 to about 10 weight percent of the emollient, based on the weight of the prills to provide emollient-bearing prills; and

coating the emollient-bearing prills with a powdered surfactant in an amount to provide about 1 to about 15 weight percent, based on the weight of the composition.

4,093,746

METHOD OF AND FODDER FOR REARING WHITE-MEAT CALVES FOR SLAUGHTER

Germano Cagliero, Ivrea (Turin), Italy, assignor to Marxer S.p.A., Turin, Italy

Filed Apr. 7, 1977, Ser. No. 785,515
Claims priority, application Italy, Apr. 23, 1976, 67991 A/76
Int. Cl.[2] A23K 1/00
U.S. Cl. 426—2 4 Claims

1. Method of increasing the growth rate of white-meat calves for slaughter, comprising systematically feeding the calves with reconstituted milk containing 40–60 ppm of nifuroxazide on a dry weight basis for substantially the entire period of growth.

4,093,747

METHOD OF AND FODDER FOR PIG-RAISING

Germano Cagliero, Ivrea (Turin), Italy, assignor to Marxer S.p.A., Turin, Italy

Filed Apr. 7, 1977, Ser. No. 785,459
Claims priority, application Italy, Apr. 23, 1976, 67990 A/76
Int. Cl.[2] A23K 1/00
U.S. Cl. 426—2 4 Claims

1. Method of increasing the growth rate of pigs in the weaning stage, comprising feeding the pigs with a fodder containing from 50 to 70 ppm of nifuroxazide.

4,093,748

PROCESS FOR THE PREPARATION OF BREAD

Shin-Ichiro Akatsuka, Tokorozawa; Shozo Akutsu, Komae, and Michio Uchida, Yokohama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,264
Claims priority, application Japan, Dec. 27, 1975, 50-155755
Int. Cl.[2] A21D 2/08, 2/34
U.S. Cl. 426—19 7 Claims

1. A process for the preparation of bread including the conventional steps of kneading, fermentation and baking, which comprises adding a mixture of a yeast extract selected from the group consisting of beer-yeast extract, sake-yeast extract, soy-yeast extract, and wine-yeast extract, and hydrolyzed egg-white to wheat flour, wherein the yeast extract is added in an amount from 0.025 to 0.075%, and the hydrolyzed egg-white is added in an amount from 0.5 to 1.5% on the basis of the amount of wheat flour.

4,093,749

PREPARATION OF YEAST LEAVENED DOUGH PRODUCTS

George P. Sternberg, 727 W. 46th St., Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 525,359, Nov. 20, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,721
Int. Cl.[2] A21D 2/04, 2/14
U.S. Cl. 426—20 11 Claims

1. A method of making a yeast leavened dough product comprising the steps of:

mixing dough ingredients consisting of flour, water, yeast, a starch digesting agent and monosodium glutamate, said monosodium glutamate added in the amount of 0.001 to 0.010 percent by weight of the flour content;

relaxing said dough at the completion of said mixing step; and

machining, proofing and baking said dough.

4,093,750
BEVERAGES CONTAINING POLYGLYCEROL ESTER CLOUD

Vigen K. Babayan, Indianapolis, Ind., assignor to Stokely-Van Camp Inc., Indianapolis, Ind.

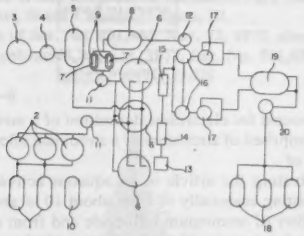
Continuation of Ser. No. 496,550, Aug. 12, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 699,997
Int. Cl.[2] H23L *2/00*
U.S. Cl. 426—250 23 Claims

1. A pastuerized beverage consisting essentially of
(a) from about 0.002% to about 2% of a polyglycerol ester of a fatty acid;
(b) from about 0.02% to about 2% of a citrus oil;
(c) a sweetening agent to provide sweetening equivalent to from about 5% to about 15% sucrose;
(d) sufficient acid to cause the beverage to have a pH of from 2.5 to 4.5; and
(e) from 84% to about 99% water.

4,093,751
PROCESS FOR TREATING MILK-COFFEE MIXTURES IN SEALED CONTAINERS TO ELIMINATE INCONSISTENCY AND DETERIORATION IN TASTE

Tadao Ueshima, 16-go, 2-ban, Takamaru, 1-chome, Tarumi-ku, Kobe-shi, Japan

Filed Oct. 8, 1975, Ser. No. 620,785
Claims priority, application Japan, Oct. 9, 1974, 49-116458
Int. Cl.[2] A23F *1/12;* B05B *3/00*
U.S. Cl. 426—407 1 Claim



1. An improved process for treating milk-coffee mixtures in sealed containers to eliminate inconsistency and deterioration in taste, wherein a hot milk-coffee which has been previously heated to a temperature of 90° to 95° C is continuously introduced into containers which are then continuously sealed, and wherein the sealed containers are permitted to accumulate in number for subsequent pasteurization or sterilization as a group, in a batch-type pressure tank, wherein the improvement comprises:
rapidly force cooling the sealed accumulated containers containing the hot milk-coffee mixture from 90° to 95° C to about 40° C in about 5 minutes, allowing the cooled containers to further cool naturally in ambient air to about room temperature and pasteurizing or sterilizing the accumulated containers in the batch-type pressure tank.

4,093,752
FLAVORING WITH 2,4,6-TRIISOBUTYL-1,3,5-TRIOXANE

Donald Arthur Withycombe, Lincroft; Braja Dulal Mookherjee, Holmdel; Manfred Hugo Vock, Locust, and Joaquin Francisco Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

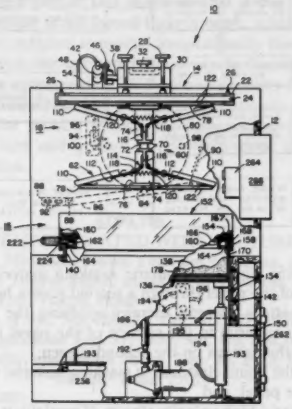
Filed Jun. 16, 1977, Ser. No. 807,056
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—536 2 Claims

1. A process for augmenting or enhancing the organoleptic properties of a foodstuff comprising the step of adding to said foodstuff 5.0 parts per million up to about 100 parts per million based on total composition of 2,4,6-triisobutyl-1,3,5-trioxane.

4,093,753
METHOD OF APPLYING FLOCK TO A SUBSTRATE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

Division of Ser. No. 714,475, Aug. 16, 1976. This application Jul. 18, 1977, Ser. No. 816,311
Int. Cl.[2] B05D *1/06, 1/12, 1/36*
U.S. Cl. 427—21 4 Claims



1. A method for flocking a substrate comprising:
(a) providing a flocking apparatus including a cabinet, a substrate holding turret with a horizontal rotatable shaft having two substrate holding metal platens diametrically opposed thereon, a screen printing apparatus located above the turret, a flocking tray located below the turret, and detent means on the turret apparatus for registering one platen with the screen printing apparatus for printing an adhesive onto the substrate associated therewith and the other platen with the flocking apparatus,
(b) positioning a high voltage metallic electrode in said flocking tray,
(d) establishing an electric field between said electrode and the platen associated therewith,
(c) and forming said cabinet and flocking tray of non-metallic materials, whereby the flock will move in a parallel, dense, straight and uniform direction from said flock tray to a printed substrate on the lowermost platen when said electric field is established and while a substrate on the uppermost platen is being printed.

4,093,754
METHOD OF MAKING DECORATIVE PANELS

Robert C. Parsons, 8003 Inwood Rd., Dallas, Tex. 78413

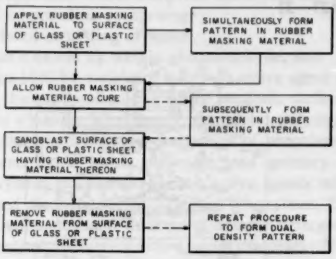
Filed Apr. 15, 1976, Ser. No. 677,363
Int. Cl.[2] B24C *3/06;* G03C *5/00;* B41N *1/24;* E06B *7/20*
U.S. Cl. 427—259 1 Claim

1. A method of making decorative panels comprising:
forming a predetermined pattern on a screen such that a portion of the screen corresponding to the pattern permits the flow of liquid therethrough;
applying liquid elastomeric masking material to a surface of a panel through the screen thereby applying the liquid elastomeric material to the surface of the panel in accordance with the pattern;
curing the liquid elastomeric masking material on the surface of the panel and thereby forming a substantially solid

masking layer on the surface of the panel in accordance with the predetermined pattern;

impinging a high velocity stream of particulate material onto the surface of the panel having the masking layer thereon and thereby visually differentiating the unmasked portion of the surface of the panel from the masked portions thereof;

subsequently removing the masking layer to provide a panel having visually differentiated areas corresponding to the previously masked and the previously unmasked portions of the surface of the panel;


APPLY RUBBER MASKING MATERIAL TO SURFACE OF GLASS OR PLASTIC SHEET
SIMULTANEOUSLY FORM PATTERN IN RUBBER MASKING MATERIAL
ALLOW RUBBER MASKING MATERIAL TO CURE
SUBSEQUENTLY FORM PATTERN IN RUBBER MASKING MATERIAL
SANDBLAST SURFACE OF GLASS OR PLASTIC SHEET HAVING RUBBER MASKING MATERIAL THEREON
REMOVE RUBBER MASKING MATERIAL FROM SURFACE OF GLASS OR PLASTIC SHEET
REPEAT PROCEDURE TO FORM DUAL DENSITY PATTERN

reapplying liquid elastomeric masking material to the surface of the panel through a second screen having a different pattern thereon thereby applying the liquid elastomeric material to the surface of the panel in accordance with the pattern on the second screen;

curing the liquid elastomeric masking material on the surface of the panel; and

impinging a high velocity stream of particulate material onto the surface of the panel having the masking layer thereon thereby visually differentiating the unmasked portion of the surface of the panel from the masked portions thereof to form a panel having a dual density pattern.

4,093,755

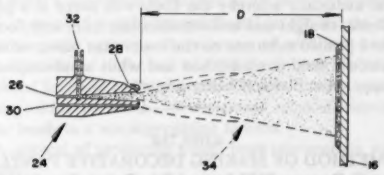
METHOD FOR MAKING A LIQUID HEAT EXCHANGER COATING

Michael M. Dahl, Lakewood, and Lester D. Erb, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 546,063, Jan. 31, 1975, Pat. No. 3,990,862. This application Jul. 26, 1976, Ser. No. 708,960

Int. Cl.[2] B05D *1/02, 1/08*

U.S. Cl. 427—299 **7 Claims**



1. A method for making a liquid heat exchanger coating comprising the steps of:

heating a plurality of powder particles of oxide film forming metal in an oxygen rich atmosphere and forming a metallic oxide film on the particles;

moving the particles with a stream of oxygen rich gas while simultaneously heating a plurality of the particles to at least a plastic state and some of the particles to a molten state;

impacting a plurality of the particles against a metallic substrate and against themselves partially deforming, securing and mechanically interlocking a plurality of the particles to the substrate and to portions of each other, breaking the oxide film and fusing some of the molten particles to portions of each other and forming unconnected portions between a plurality of particles that define a plurality of open nucleation cells and the unconnected portions also forming porous interconnections between nucleation cells.

4,093,756

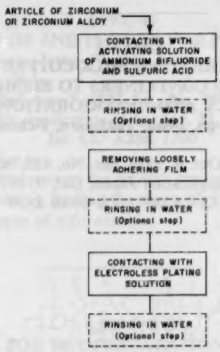
PROCESS FOR ELECTROLESS DEPOSITION OF METALS ON ZIRCONIUM MATERIALS

Robert E. Donaghy, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 4, 1976, Ser. No. 729,860

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—304 **19 Claims**


ARTICLE OF ZIRCONIUM OR ZIRCONIUM ALLOY
CONTACTING WITH ACTIVATING SOLUTION OF AMMONIUM BIFLUORIDE AND SULFURIC ACID
RINSING IN WATER (Optional step)
REMOVING LOOSELY ADHERING FILM
RINSING IN WATER (Optional step)
CONTACTING WITH ELECTROLESS PLATING SOLUTION
RINSING IN WATER (Optional step)

1. A process for electroless deposition of a metal film on an article comprised of zirconium or a zirconium alloy comprising the steps of

(a) activating the article in an aqueous activating solution consisting essentially of from about 10 to about 20 grams per liter of ammonium bifluoride and from about 0.75 to about 2 grams per liter of sulfuric acid, the solution being aged by immersion of pickled zirconium in said solution for about 10 minutes,

(b) removing any loosely adhering film formed on the article in the activating step, and

(c) contacting the article with an electroless plating solution capable of plating the activated article and containing the metal to be deposited thereon upon sufficient contact with the article.

4,093,757

METHOD OF FORMING AND DEPOSITING MONOMOLECULAR LAYERS OF AMPHIPHILIC MOLECULES ON A SUBSTRATE

André Barraud, Bures-sur-Yvette; Roger Gras, Villiers le Bacle, and Michel Vandevyver, Chatenay Malabry, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Feb. 2, 1977, Ser. No. 765,063

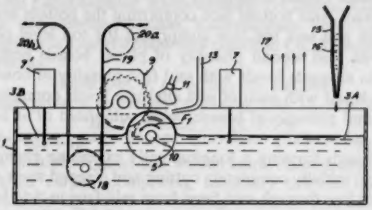
Claims priority, application France, Feb. 11, 1976, 76 03756

Int. Cl.[2] B05D *1/20*

U.S. Cl. 427—434 A **11 Claims**

1. A method for producing and depositing a monomolecular layer of amphiphilic molecules on a substrate, of the type comprising a first step of formation of said layer from a solution of said molecules in a suitable solvent by introduction of said solution on a liquid surface and by removal of the solvent, a second step of application of a predetermined surface pressure to the layer thus formed and a third step of deposition of said layer on a substrate, wherein the operation is performed on a liquid surface divided into at least first and second adja-

cent liquid containing compartments, at least two adjacent compartments being separated by a horizontal member which is partly immersed in said liquid and capable of rotating on its own axis, wherein the solution of said molecules is introduced into said first compartment, wherein removal of the solvent is carried out and wherein transfer of the molecules of the mono-



molecular layer and application of a predetermined surface pressure to the layer thus formed are carried out by transferring said layer from said first compartment to at least said second adjacent compartment by imparting rotational motion to said member which provides a separation between said compartments.

4,093,758

ARTIFICIAL CHRISTMAS TREE WITH FOLDABLE BRANCHING AND METHOD OF MAKING SAME

Robert J. Weskamp, Prospect Heights, and Robert H. Barclay, Monee, both of Ill., assignors to Industrial Park Machine & Tool Co, Inc., South Chicago Heights, Ill.

Continuation of Ser. No. 631,446, Nov. 13, 1975, abandoned.
This application May 31, 1977, Ser. No. 301,652
Int. Cl.[2] A47G *33/06*
U.S. Cl. 428—8 **3 Claims**

1. In an artificial Christmas tree of the type including a central trunk and a plurality of branches pivotally movable to and from positions outstanding from said trunk and from and to positions substantially co-axial with said trunk, the improvement comprising an improved means for pivotally mounting at least one of said branches on said trunk, said improved means comprising:

the provision of a hole in said trunk;

a pivotal mounting member having a rear end portion press fitted into said hole, a front end portion extending outwardly from said trunk and a pivot member mounted on said front end portion rearwardly of the front end thereof; said front end portion of said pivot mounting being U-shaped, said pivot member extending between the legs of said U in spaced relation with the bight thereof, said one branch having its rear end pivotally mounted about said pivot member whereby, when said branch is pivotally moved to its outstanding position, it engages the front end of said front end portion to be held thereby in said outstanding position;

said U-shaped front end portion having a pair of aligned apertures for mounting said pivot member, one of said apertures having a larger diameter than the other, and said pivot member being formed of elastically deformable material and comprising a head having a diameter larger than said one aperture, a shank having a head end portion of diameter smaller than said one aperture and larger than the other and a tapered tail end portion, said shank further including a circumferential groove at the junction of said head and tail end portions of width greater than the length of said other aperture wherein said pivot member is an integral member injection molded from plastic, the edge of said groove on the tail end portion having a diameter greater than the diameter of said other aperture, said shank further having a slot extending across said shank from the tail end thereof to at least the plane of the edge of said groove on the head end portion of said shank, said slot being of sufficient width to permit inward flexing of said tapered end of said shank so that it can clear said other aperture when forced therethrough, whereby when said pivot member is moved longitudinally through said one aperture the tail end portion can be forced through said other aperture until said groove registers therewith, whereupon said tail end portion will elastically expand to dispose the portion of said leg surrounding said other aperture into said groove to hold said pivot member in said position.

4,093,759

GLASS CONTAINER COATED WITH POLYURETHANE

Akira Otsuki; Michihisa Naito; Yukifumi Mashimo, and Akira Ikeda, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 428,586, Dec. 26, 1973, abandoned.
This application Feb. 17, 1976, Ser. No. 658,789
Claims priority, application Japan, Dec. 23, 1972, 47-128840
Int. Cl.[2] B65D *1/02*
U.S. Cl. 428—35 **4 Claims**

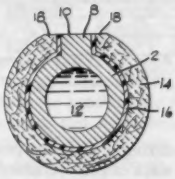
1. A glass container carrying on the surface thereof a single layer coating of a transparent non-tacky film in a thickness of at least 100 microns and having a tensile strength of at least 300 kg/cm^2 and a percent elongation of at least 200%, said film being a cured high molecular weight compound formed by the reaction of a powder having a particle diameter of about 1 to 100 microns of a solid compound having a melting point of more than 20° C. selected from the group consisting of melamine, benzoguanamine, and acetoguanamine with 0.9 to 1.5 equivalents per equivalent of said powder of a urethane prepolymer which is normally liquid and has at least 2 isocyanate groups and has a molecular weight of at least 400 per isocyanate group, said coating having been cured at a temperature of 180° to 200° C.

4,093,760

SKID PIPE INSULATION FOR STEEL MILL REHEATING FURNACES

Martin Bernard O'Malley, Pittsburgh, Pa., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 26, 1976, Ser. No. 690,220
Int. Cl.[2] B29C *17/04*
U.S. Cl. 428—36 **13 Claims**



1. The method of insulating a steel mill reheat furnace skid pipe which comprises adhering to said skid pipe an unbonded, unreinforced batt of refractory fiber, said batt being disposed in adhered position so that no significant portion thereof extends

above the level of the top of the rail projection of said skid pipe.

12. An insulating structure for a steel mill reheat furnace skid pipe formed according to the method of claim 1.

4,093,761

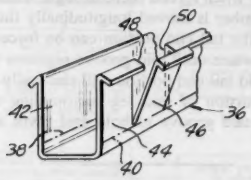
SHEET WITH BREAKAWAY LINE

Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.

Continuation-in-part of Ser. No. 232,730, Mar. 8, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,653

Int. Cl.[2] B65D *65/28;* **G09F** *3/00;* **B32B** *3/04*

U.S. Cl. 428—43 **3 Claims**



1. A sheet of extruded plastic material having a breakaway line disposed substantially parallel to an edge of said sheet, said sheet being of substantially constant thickness and said breakaway line being a non-apparent line of reduced elasticity along an autogenous weakened bond of said plastic material, said breakaway line being formed during extrusion of said sheet by causing the flow of plastic material to separate and rejoin along said line.

2. The sheet of extruded plastic material of claim 1 wherein said sheet is in the form of a U-shaped channel structure having a base portion and a pair of substantially parallel side walls integral with said base portion, and wherein at least one of said side walls is of said substantially constant thickness from bottom to top and has said breakaway line of reduced elasticity parallel to the top edge of said side wall proximate the base portion of said channel.

4,093,762

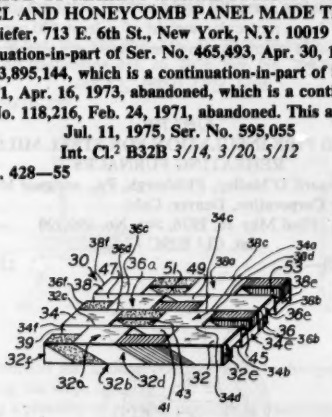
METHOD OF MAKING A HARDCORE HONEYCOMB PANEL AND HONEYCOMB PANEL MADE THEREBY

John Kiefer, 713 E. 6th St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 465,493, Apr. 30, 1974, Pat. No. 3,895,144, which is a continuation-in-part of Ser. No. 351,671, Apr. 16, 1973, abandoned, which is a continuation of Ser. No. 118,216, Feb. 24, 1971, abandoned. This application Jul. 11, 1975, Ser. No. 595,055

Int. Cl.[2] B32B *3/14, 3/20, 5/12*

U.S. Cl. 428—55 **20 Claims**



1. A method of making a hardcore panel comprising the steps of providing a stack of predetermined width comprising a first plurality of parallel substantially uniform first width planar boards of grained lumber and a second plurality of parallel planar boards of grained lumber having a second substantially uniform width less than said first width with said first and second plurality of boards being fastened together and arranged in said stack in step-wise fashion in a plurality of levels with said first width being substantially equivalent to said stack width, said stack having opposed top and bottom parallel faces, opposed front and rear faces and a pair of opposed parallel side faces, with the top and bottom faces and side faces being substantially planar and the front and rear faces being stepped from said bottom to said top face, said first width planar boards comprising said bottom and said top faces of said stack, said bottom face comprising the bottom level of said stack and said top face comprising the top level of said stack with said second plurality of planar boards being arranged in alternate levels with said first plurality of boards in said stack and with each of said alternate levels comprised of said second plurality of boards being comprised of at least a pair of substantially uniformly spaced apart second width planar boards forming a longitudinally extending channel in said stack; initially completely cutting said stepped stack along a first cut line through said faces from said face to side face at a predetermined acute angle between said first cut line and said bottom face to provide a substantially planar front face normal to said first cut line, said front face being sloped between said parallel planar top and bottom faces at said acute angle with respect to the plane of said bottom face; completely cutting said initially cut stepped stack at a predetermined distance from said first cut line along said side face along a second cut line through said side faces from side face to side face at said predetermined acute angle between said second cut line and said bottom face to provide a first cut portion from said stepped stack having a substantially planar rear face for said first cut portion normal to said second cut line, said first cut portion front and rear faces being parallel completely cutting said first cut portion through said first cut portion front face from said first cut portion front face to said first cut portion rear face along a third cut line normal to said bottom face to provide a first plurality of substantially identical cut segments each having said first cut portion sloping front and rear faces and whose top, front, bottom and rear faces are rectangular and whose side faces are rhomboidal, each of said first plurality of cut segments comprising said stack between said top and bottom faces with the top and bottom faces of each board in said stack being parallel to said cut segment top and bottom faces; and fastening said cut segments together with said front faces in a common plane with alternate adjacent fastened segments being rotated 180° about a longitudinal axis through the center of said segment parallel to said front face slope to provide a top and bottom surface for said fastened segments comprising alternating inverted sloping surfaces of said segment top and bottom faces whose slope is at an angle supplementary to said acute angle to provide said panel with a portion of said sloping surfaces defining sloping channels in said panel, whereby a honeycomb hardwood panel is provided.

14. A hardcore panel comprising a plurality of adjacent batten-like members fastened together in a substantially planar configuration, each of said batten-like members having a top face, an opposed bottom face, a pair of opposed side faces, each of said faces being substantially normal to the adjacent face of said batten-like member, each of said batten-like members comprising a fastened plurality of stacked adjacent board segments of grained lumber, each of said segments having a top face, an opposed bottom face, a pair of opposed end faces and a pair of opposed side faces, said board segments being stacked along the longitudinal axis of said batten-like member from one of said batten-like member end faces to said opposed end face, at least a portion of said board segments defining a channel therethrough, said adjacent board segment end faces being fastened together and being substantially parallel to each other, said adjacent board segments top, bottom and side faces comprising said batten-like member top, bottom and side faces respectively, each of said segment adjacent end faces for every other one of said fastened batten-like members in said plurality forming a predetermined acute angle with said longitudinal axis, each of said adjacent end faces comprising said batten-like members adjacent to said every other one in said plurality forming a predetermined obtuse angle with said longitudinal

axis which is supplementary to said predetermined acute angle, whereby a honeycomb panel is provided.

4,093,763

MULTIPLE-LAYERED NON-WOVEN FABRIC

Ludwig Hartmann, Kaiserslautern; Paul F. Maahs, Bad Durkheim; Lüder Gerking, Kaiserslautern; Ivo Ruzek, Kaiserslautern, and Eberhard Schäfer, Kaiserslautern, all of Germany, assignors to Lutravil Spinnvlies GmbH & Co., Kaiserslautern, Germany

Filed Oct. 9, 1975, Ser. No. 621,069
Claims priority, application Germany, Oct. 10, 1974, 2448299
Int. Cl.[2] B32B *27/34, 27/36*
U.S. Cl. 428—95 **13 Claims**

1. A multiple-layered non-woven fabric suitable as a backing for tufted carpet, comprising randomly oriented synthetic filaments having points of bonding therebetween, said fabric exhibiting substantially isotropic strength parameters over its surface, said fabric having a weight per unit area of between about 100 and 150 metric pounds/m^2, said fabric having in an untufted condition a specific strength parameter A equaling at least 130, wherein

$$A = \frac{\text{Breaking load of a 5 cm. wide strip in p}}{\text{Weight per unit area in p/m}^2}$$

and said fabric having, after tufting with a continuous synthetic filament, a strength parameter $B \geqq 0.9$ A, but at least 140, wherein

$$B = \frac{\text{Breaking load of a 5 cm wide strip in p, measured along the tuft rows}}{\text{Weight per unit area of the fabric in p/m}^2}$$

and a strength parameter $C \geqq 0.8$ A, but at least 120, wherein

$$C = \frac{\text{Breaking load of a 5 cm wide strip in p, measured transverse to the tuft rows}}{\text{Weight per unit area of the fabric in p/m}^2}$$

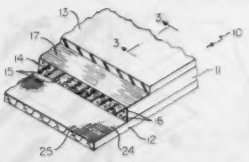
said points of bonding between said randomly oriented continuous synthetic filaments being clearly graduated with respect to their number, magnitude and configuration over the thickness of said fabric, with both sides of said fabric differing from each other as regards said filament bonding.

4,093,764

COMPRESSIBLE PRINTING BLANKET

John C. Duckett, Clyde, and Andrew J. Gaworowski, Waynesville, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 13, 1976, Ser. No. 731,888
Int. Cl.[2] B32B *5/22, 5/12, 3/26*
U.S. Cl. 428—113 **18 Claims**



1. A compressible printing blanket comprising, a woven base ply, a rubber printing face, and a compressible body disposed between said base ply and said printing face, said compressible body comprising an elastomeric matrix having voids disposed therein substantially uniformly and a plurality of needle-punched layers of discontinuous fibers bonded together by said matrix as a single mass, each of said layers having its fibers disposed in substantially parallel relation and substantially uniformly throughout the layer with the fibers in each layer being disposed transverse and against the fibers of an adjoining layer to define a compacted sheet of oriented discrete fibers which results in a uniform embedment of fibers throughout said matrix, said uniform embedment of said fibers resulting in said uniform disposal of said voids and providing more precise control of the compression and resiliency characteristics of said body at each location throughout, said body assuring satisfactory operation of said blanket over a substantial range of interference between said blanket and printing means associated therewith, said voids comprising about 40-60% of the volume of the compressible body.

4,093,765

SOFT ABSORBENT FIBROUS WEB AND DISPOSABLE DIAPER INCLUDING SAME

Frank P. Schmidt, Cheltenham Township, Montgomery County, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 13, 1976, Ser. No. 657,893
Int. Cl.[2] A61F *13/16, 13/18, 13/20;* **B32B** *3/10*
U.S. Cl. 428—134 **16 Claims**

1. A disposable sanitary product including a liquid-pervious facing layer adapted to be positioned in contact with a wearer, a low density batt of cellulosic fibers disposed beneath the facing layer for absorbing body fluids, and a fibrous wicking layer disposed beneath, and in engagement with said fibrous batt for aiding in distributing the flow of fluid within said product, the improvement wherein said wicking layer is an embossed and creped fibrous web formed from an aqueous slurry, and comprises:

(a) randomly arranged and contacting sulfate wood pulp fibers constituting the predominate fiber component, by weight, of the web, said fibers being bonded together through a portion of the thickness of the web almost exclusively by papermaking bonds, said portion being substantially free of debonders and wet strength additives;

(b) a plurality of fractured areas provided by embossing, said fractured areas being in the form of apertures extending through the web thickness, said apertures being disposed in spaced-apart areas which are substantially uniformly distributed throughout the web;

(c) an adhesive bonding material extending only partially through the web thickness to form bonded regions having a greater strength than the portion of the web in which the fibers are bonded together almost exclusively by the papermaking bonds, said web being creped in regions containing bonding material to enhance web softness and to foreshorten the web to enhance its stretch;

(d) said web having a basis weight of from about 25 to about 100 lbs./2,880 $feet^2$, a greater density than that of the fluff batt, said density being in the range of from about 0.08 grams/cc to less than about 0.16 grams/cc, a liquid holding capacity greater than 500%, an absorbency rate of less than 2.5 seconds, a wicking rate of greater than 14 cm/10 minutes, a minimum cross-machine-direction stretch of 10% and a wet cross-machine-direction tensile strength of greater than 2 oz./inch.

8. A soft, absorbent, embossed and creped fibrous web formed from an aqueous slurry, said web comprising:

(a) randomly arranged and contacting sulfate wood pulp fibers constituting the predominate fiber component, by weight, of the web, said fibers being bonded together through a portion of the thickness of the web almost exclusively by papermaking bonds, said portion being substantially free of debonders and wet strength additives;

(b) a plurality of fractured areas provided by embossing, said fractured areas being in the form of apertures extending through the web thickness, said apertures being disposed in spaced-apart areas which are substantially uniformly distributed throughout the web;

(c) an adhesive bonding material extending only partially through the web thickness to form adhesively bonded regions having a greater strength than underlying regions which are bonded together almost exclusively by the papermaking bonds, said web being creped in regions containing bonding material to enhance web softness and to foreshorten the web to enhance its stretch;

(d) said web having a basis weight in the range of from about 25 to about 100 lbs./2,880 feet^2, a density of from about 0.08 grams/cc to less than about 0.16 grams/cc, a liquid holding capacity of greater than 500%, an absorbency rate of less than 2.5 seconds, a wicking rate of greater than 14 cm/10 minutes, a minimum cross-machine-direction stretch of 10% and a wet cross-machine-direction tensile strength of greater than 2 oz./inch.

4,093,766

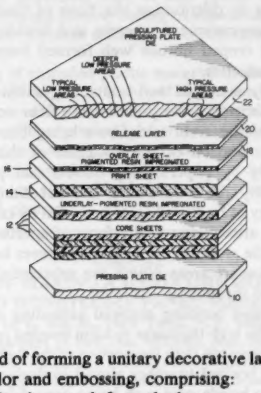
THREE-COLOR HIGH PRESSURE DECORATIVE LAMINATE HAVING REGISTERED COLOR AND EMBOSSING

Herbert I. Scher, Randallstown; Joseph A. Lex, Glen Burnie, and Israel S. Ungar, Randallstown, all of Md., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 594,094, Jul. 8, 1975, abandoned. This application May 16, 1977, Ser. No. 797,205

Int. Cl.^{2} B32B *3/30, 31/20*

U.S. Cl. 428—165 **14 Claims**



1. A method of forming a unitary decorative laminate having registered color and embossing, comprising:

A. assembling in a stack from the bottom up:

(1) backing means for said decorative laminate,

(2) a fibrous underlay sheet impregnated with a thermosetting resin impregnating solution having dispersed therein finely divided pigment of a first color, said pigment being retained substantially between the fibers of said underlay sheet,

(3) a thermosetting resin impregnated fibrous print sheet provided with a second color contrasting with said first color,

(4) a fibrous overlay sheet impregnated with a thermosetting resin impregnating solution having dispersed therein finely divided pigment of a third color contrasting with said first and second colors, said pigment of said third color being retained substantially between the fibers of said overlay sheet, and

(5) a sculptured pressing plate die having a surface with high areas, intermediate areas and low areas capable of being impressed into the uppermost of said fibrous sheets, and means to prevent said sculptured pressing plate die from sticking to said overlay sheet during lamination;

B. applying to the upper and lower surfaces of said assembly sufficient heat and pressure to cure said resins to produce said unitary embossed decorative pressure laminate by

(1) effecting a lamination of said fibrous sheets together with each other and with said backing means,

(2) imparting the sculptured surface of said die to the uppermost of fibrous sheets,

(3) effecting lateral flow of said thermosetting resin and the pigment of said third color within said overlay sheet from the debossed portions of the surface of said laminate to the intermediate portions of said laminate so that said second color is visible in said debossed portions and said third and contrasting color of said finely divided pigment is visible in said intermediate portions, and

(4) effecting vertical flow of said thermosetting resin and the pigment of said first color within said underlay sheet from said underlay sheet to the upper surface portion of said overlay sheet in the areas of the highest peaks so that said first color is visible in the highest embossed portions to contrast with the second color at said debossed portions and the third color at said intermediate portions; and

C. stripping said sculptured die from the resultant laminated assembly so as to provide said laminate having areas of registered color and embossing.

10. A unitary decorative high pressure laminate having a pebbly appearance, comprising

a plurality of resin impregnated paper sheets laminated together to form an integral laminate having a plurality of layers and having on the upper surface thereof debossed portions, embossed portions of intermediate height 2–10 mils, and embossed high peaks of 14–24 mils height;

the upper layer of said laminate having therein at least one first color in the area of said high peaks;

said debossed portions being relatively devoid of pigment within the upper layer and being transparent to show therebeneath a second color; and

said intermediate embossed portions having concentrated porportions of an opacifying pigment of a third color in the upper layer of said laminate, wherein there is a gradual transition of said second and third colors between said intermediate height portions and said debossed portions.

4,093,767

COPY SHEET SUITABLE FOR THERMOCOPYING

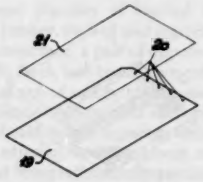
Einar Munk Laursen, Rodovre, Denmark, assignor to Memofax A/S, Copenhagen, Denmark

Filed Jun. 1, 1976, Ser. No. 691,835

Claims priority, application Denmark, Jun. 3, 1975, 2473/75

Int. Cl.^{2} B32B *3/02*

U.S. Cl. 428—194 **3 Claims**



1. A thermocopying copy sheet containing in at least one margin a heat responsive adhesive adapted to be activated by the heat transmitted by a thermocopier as the copy sheet and a superimposed original pass therethrough so as to releasably affix the original to the copy sheet so as to prevent movement of the original relative to the copy sheet.

4,093,768

COPPER FOIL ELECTRICAL LAMINATE WITH REINFORCED PLASTICS

Howard P. Cordts, Grafton; Robert F. Navin, and R. Charles Ross, both of Port Washington, all of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Feb. 19, 1976, Ser. No. 659,480
Int. Cl.[2] B32B 15/08, 15/20, 15/14
U.S. Cl. 428—287 3 Claims

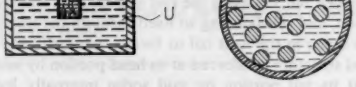
1. A copper foil electrical laminate comprising a sheet of copper or copper alloy foil directly bonded to glass fiber reinforced unsaturated polyester resin containing up to about 2% by weight, based on the unsaturated polyester resin syrup of benzotriazole incorporated in said resin prior to curing of said resin.

4,093,769

CAPILLARY BODY AND METHOD OF PRODUCING THE SAME

Yoshio Midorikawa, Tokyo, Japan, assignor to Glasrock Products, Inc., Fairburn, Ga.

Filed Mar. 10, 1976, Ser. No. 665,622
Claims priority, application Japan, Feb. 18, 1976, 51-16849
Int. Cl.[2] B43K 1/12; D04H 3/14
U.S. Cl. 428—295 8 Claims



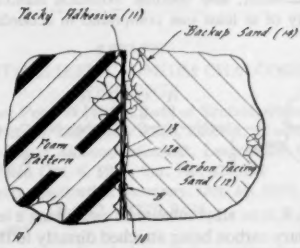
1. A method for producing capillary body comprising:
forming a plurality of fibers into a fiber bundle;
forming a skin around the outer periphery of said fiber bundle;
impregnating the skin-encased fiber bundle with a urethane prepolymer, water and a solvent for said prepolymer; then
polymerizing said prepolymer whereby the gases generated by reaction and by volatilization of the solvent form capillary passages along said fibers.

4,093,770

COATING FOR GASIFIABLE FOAM PATTERNS

Adolf Hetke, Livonia, and Kip M. Bonds, Union Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 608,959, Aug. 29, 1975, Pat. No. 4,010,791.
This application Dec. 13, 1976, Ser. No. 750,347
Int. Cl.[2] B32B 3/26, 5/16
U.S. Cl. 428—306 2 Claims



1. A destructible pattern for use in the cavityless method of casting, comprising:
(a) a body of foam thermoplastic resinous material in a predetermined shape conforming to the shape of a desired metal casting,
(b) a first coating layer covering entirely the outer surface of said body, said first coating layer presenting an exposed highly tacky viscous adhesive surface, said first coating layer not only adhering to said body and filling surface crevices of said body but also securing dry particles brought into contact with said exposed surface, and
(c) a second coating layer covering coating substantially the first layer, said second coating layer consisting essentially of dry refractory particles, each particle being unsecured with respect to each other but secured by the adhesive qualities of said exposed surface to said first coating layer.

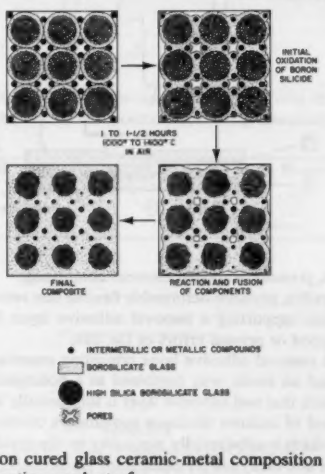
2. The destructible pattern as in claim 1, in which the particles of said second coating layer are aligned side by side and substantially only particle deep to provide for a permeable and highly smooth casting wall.

4,093,771

REACTION CURED GLASS AND GLASS COATINGS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, Howard E. Goldstein, Saratoga, Calif.; Daniel B. Leiser, and Victor W. Katvala, both of San Francisco, Calif.

Filed Oct. 29, 1976, Ser. No. 736,910
Int. Cl.[2] B32B 5/18, 17/06
U.S. Cl. 428—312 14 Claims


INITIAL OXIDATION OF BORON SILICIDE
1 TO 1-1/2 HOURS 1000° TO 1400° C IN AIR
FINAL COMPOSITE
REACTION AND FUSION OF COMPONENTS
INTERMETALLIC OR METALLIC COMPOUNDS
BOROSILICATE GLASS
HIGH SILICA BOROSILICATE GLASS
PORES

1. A reaction cured glass ceramic-metal composition comprising the reaction product of:
(a) the reaction of about two tenths to about 6 percent by weight of a less than about 80 mesh powder of a substance selected from the group consisting of silicon tetraboride, silicon hexaboride, boron silicides, boron and mixtures thereof, with;
(b) finely divided particles of a reactive glass frit prepared by combining two tenths of a part to 10 parts boron oxide with 100 parts of a porous high silica borosilicate glass wherein said glass frit is sintered rather than fused and is a two-phase glass with a very reactive high boron oxide borosilicate glass layer on the outside covering a more refractory low boron content high silica borosilicate glass in the core of each particle.

6. A high temperature resistant article comprising a reaction cured glass coating composition resulting from the process of:
(a) reacting about two tenths of a percent to about 6 percent by weight of a less than about 80 mesh powder of a substance selected from the group consisting of silicon tetraboride, silicon hexaboride, other boron silicides, boron and mixtures thereof, with a finely divided particulate reactive glass frit prepared by combining two tenths of a

part to 10 parts of boron oxide with 100 parts of a porous high silica borosilicate glass wherein said glass frit is sintered rather than fused and is a two-phase glass with a very reactive high boron oxide borosilicate glass layer on the outside covering a more refractory low boron content high silica borosilicate glass in the core of each particle;

(b) blending the reaction product in a ball mill with a carrier solution and a prebinder in a ratio of 35 to 50 percent by weight solid components to provide a coating slurry;

(c) applying said coating slurry to a porous silica glass substrate or a ceramic substrate;

(d) drying said coating at about 20° to about 100° C; and

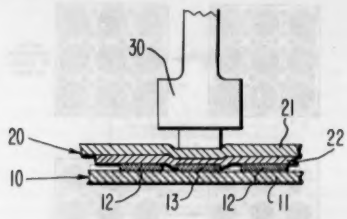
(e) glazing said coating for about one half to two hours at about 1000° to about 1400° C, by inserting the coated substrate into the furnace at temperature and removing it rapidly after glazing.

4,093,772

PRESSURE-ACTIVATED AND NON-TACKY LIFT-OFF ELEMENT AND PROCESS THEREFOR

Jerry H. Taylor, Webster, and Gabriel T. Turula, Rochester, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 31, 1977, Ser. No. 764,204
Int. Cl.² B32B *27/08, 27/10*
U.S. Cl. 428—339 **15 Claims**



1. A pressure-activated element comprising:

a flexible, pressure-deformable flexible film substrate foundation supporting a removal adhesive layer for removing typed or printed errors or the like;

said removal adhesive layer consisting essentially of a resin and an amide wax combined as a homogeneous coating such that said adhesive layer is substantially homogeneous and of uniform thickness providing a continuous stratum which is substantially non-tacky to the touch.

9. A non-tacky lift-off element for use as a tape, ribbon, sheet or tab for removing printed characters comprising:

a flexible film substrate;

a non-tacky coating on the substrate consisting essentially of:

a synthetic non-crystalline amide wax;

a polyamide resin and plasticizers therefor, and

a solvent; and wherein the solvent is less than 80% of the coating by weight upon application of the coating to the substrate.

15. A process for producing pressure-activated elements for removing types or printed errors or the like comprising the steps of producing a composition consisting essentially of:

a resin; and

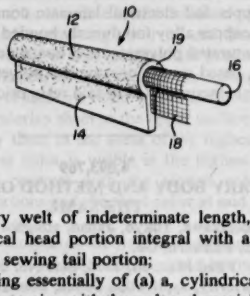
between 14 to 26% by weight of an amide wax material; and between 42 and 78% by weight of a volatile solvent vehicle consisting of an alcohol, toluene, or mixture thereof; and subsequently applying said composition to a flexible, pressure-deformable foundation, and then evaporating said vehicle to form an adhesive layer on the foundation in which said adhesive layer is substantially homogeneous and of uniform thickness and provides a continuous stratum which is substantially non-tacky.

4,093,773

FINISHING WELT, AND METHOD AND APPARATUS FOR FORMING FINISHING WELTS

Edward M. Danko, Detroit, Mich., assignor to Color Custom Compounding, Inc., Warren, Mich.

Filed Sep. 20, 1976, Ser. No. 724,815
Int. Cl.² D02G *3/00*
U.S. Cl. 428—365 **3 Claims**



1. An upholstery welt of indeterminate length, having a generally cylindrical head portion integral with a generally radially projecting sewing tail portion;

the welt consisting essentially of (a) a, cylindrical, flexible plastic rod coextensive with the welt and coaxially located within the head of the welt, (b) a fabric scrim wrapped about the rod in the head portion of the welt and having an end portion extending radially into the welt tail portion for reinforcement, and (c) an outer layer of thermoplastic material having an outer, generally key-hole shaped surface, the plastic material encasing the scrim in the region of the welt tail, encasing the rod and scrim in the head of the welt, and self-bonding to itself through the interstices of the scrim in the welt tail to form a, generally key-hole shaped structure reinforced at its head portion by said rod and at its tail portion by said scrim internally located therein.

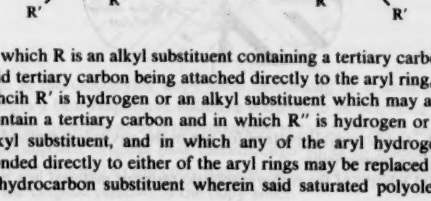
4,093,774

STABILIZED POLYMERIC COMPOSITION IN CONTACT WITH METALS

Ray Lawson Hartless, Lopatcong Township, Warren County, and Anthony Marion Trozzolo, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 500,957, Aug. 27, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,642
Int. Cl.² B32B *15/00*; D02G *3/00*
U.S. Cl. 428—379 **8 Claims**

1. An article comprising a metal surface which is in intimate contact with a polymeric composition wherein the said polymeric composition exclusive of filler is at least 90 percent by weight of essentially saturated polyolefin polymer, said polymer containing a stabilizer composition characterized in that the said stabilizer composition contains only one thermal oxidation stabilizer, said thermal oxidation stabilizer consisting essentially of at least one compound in accordance with the formula



in which R is an alkyl substituent containing a tertiary carbon, said tertiary carbon being attached directly to the aryl ring, in whcih R' is hydrogen or an alkyl substituent which may also contain a tertiary carbon and in which R'' is hydrogen or an alkyl substituent, and in which any of the aryl hydrogens bonded directly to either of the aryl rings may be replaced by a hydrocarbon substituent wherein said saturated polyolefin

polymer contains a percentage by weight of said thermal oxidation stabilizer in the range of 0.01 to 0.5.

4,093,775

TREATING A POLYMERIC SHAPE WITH NONIONIC FLUOROCHEMICAL SURFACTANTS AND PRODUCT THEREFROM

Alex J. Szur, North Plainfield, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 560,698, Mar. 21, 1975, Pat. No. 3,980,715. This application Apr. 27, 1976, Ser. No. 680,787

Int. Cl.[2] B32B *27/00*; D02G *3/00*

U.S. Cl. 428—394 30 Claims

1. A process of treating a polymeric shape with an effective amount of a nonionic fluorochemical surfactant selected from the group consisting of:

(a) condensation product of one mole of 6-hydroxyhexyl perfluoroisopropyl ether with from about 1 to about 20 moles of ethylene oxide, and

(b) condensation product of one mole of 2,2,3,4,4,4-hexafluorobutanol with from about 1 to about 6 moles of propylene oxide and with from about 0 to about 20 moles of ethylene oxide to improve lubricity properties, antistatic properties and antisoiling properties of the shape.

10. A polymeric shape produced by the process of claim 1.

11. The process of claim 1 wherein the polymeric shape is treated with an effective amount of a condensation product of one mole of 6-hydroxyhexyl perfluoroisopropyl ether with from about 1 to about 20 moles of ethylene oxide to improve lubricity properties, antistatic properties and antisoiling properties of the shape.

4,093,776

PROCESS FOR PREPARATION OF SPONTANEOUSLY-CROSSLINKED ALKALI METAL ACRYLATE POLYMERS

Shuzo Aoki, Ito, and Harumasa Yamasaki, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1977, Ser. No. 836,058

Claims priority, application Japan, Oct. 7, 1976, 51-120591

Int. Cl.[2] C08F *120/06, 2/32*

U.S. Cl. 428—402 7 Claims

1. A process for the preparation of powdery, spontaneously crosslinked, alkali metal acrylate homopolymer having a water absorption capacity of at least 400 grams per one gram of dried polymer, said process comprising dispersing and suspending an aqueous solution of an alkali metal acrylate having a concentration of at least 40% by weight and containing a water-soluble radical polymerization initiator in a liquid aliphatic hydrocarbon solvent, in the presence of a sorbitan fatty acid ester having an HLB value of 3 to 6, and polymerizing the alkali metal acrylate in the absence of a crosslinking agent.

4,093,777

COATED STABILIZED CADMIUM CHALCOGENIDE PIGMENTS

Heinrich Heine; Peter Woditsch, both of Krefeld; Theodor Bohmann, Leverkusen, and Dieter Räde, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1975, Ser. No. 620,092

Claims priority, application Germany, Oct. 10, 1974, 2448338

Int. Cl.[2] B32B *9/04*

U.S. Cl. 428—403 7 Claims

1. A coated stabilized cadmium chalcogenide pigment carrying a coating of at least one sparingly-soluble sulfide.

7. In a lacquer or plastic pigmented with about 0.1 to 50% by weight of cadmium chalcogenide, the improvement wherein said cadmium chalcogenide is a coated pigment according to claim 1, whereby the pigment is stabilized against leaching out therefrom of cadmium.

4,093,778

INGOT MOLD FOR PRODUCING STEEL INGOTS

Frederick V. Reven, Homewood, and Charles W. Connors, Wilmette, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sep. 10, 1976, Ser. No. 722,176

Int. Cl.[2] B22C *3/00*

U.S. Cl. 428—411 10 Claims

1. An ingot mold for producing steel ingots having its inner surfaces coated with a composition consisting essentially of:

Ingredients	% By Weight
A. Finely divided Fe_2O_3	5 - 30
B. A lignosulfonate	.1 - 25
C. Water	Balance

4,093,779

PAPER COATED WITH AMMONIA-CONTAINING SIZING COMPOSITIONS

Ralph Waldo Emerson, Boston, Mass., and John R. Shattuck, Cumberland Foreside, Me., assignors to The Plasmine Corporation, Portland, Me.

Division of Ser. No. 565,810, Mar. 31, 1975, Pat. No. 4,022,634, which is a continuation-in-part of Ser. No. 542,943, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 436,917, Jan. 28, 1974, abandoned. This application Feb. 4, 1977, Ser. No. 765,610

Int. Cl.[2] B32B *9/04, 23/08, 21/04, 27/10*

U.S. Cl. 428—411 9 Claims

1. Paper sized with from about 0.05 to 4 percent by dry weight based on the weight of the fibers of a sizing agent comprising from about 3 to 30 percent ammonia, from about 4 to 72 percent ammonium salt, and from about 93 to 25 percent of a rosin that is modified with from about 5 to 50 percent, based on the weight of the rosin, of an organic acidic compound selected from the group consisting of maleic acid, maleic anhydride, fumaric acid, and their mixtures, based on the total weight of the ammonia, the ammonium salt and the rosin and organic acidic compound on a dry basis and using an ammonium salt to ammonia ratio of greater than about 1 to 1.

4,093,780

TREATMENT OF ZINC SURFACES TO INHIBIT WET STORAGE STAINING AND PRODUCTS EMPLOYED THEREIN

Rodney Lash LeRoy, Pointe Claire, Canada, assignor to Noranda Mines Limited, Quebec, Canada

Division of Ser. No. 386,628, Aug. 8, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 633,100
Claims priority, application Canada, Aug. 21, 1972, 149910
Int. Cl.[2] B32B *15/08;* B05D *3/00*
U.S. Cl. 428—458 18 Claims

1. Zinc or galvanized articles having a wet storage staining and white rust inhibiting surface coating consisting essentially of a protective water-insoluble zinc-thioglycolate or zinc-polythioglycolate complex.

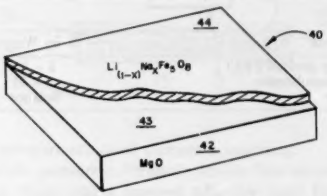
6. A method for inhibiting wet storage staining and formation of white rust on zinc surfaces which comprises treating said surfaces with an inhibiting composition, which composition comprises 0.01% to 99% by weight, as active compound, of an ester of polyester of thioglycolic acid for producing a protective, water insoluble complex zinc-thioglycolate or zinc-polythioglycolate on the zinc surface.

4,093,781

EPITAXIAL, SODIUM-SUBSTITUTED LITHIUM FERRITE FILMS

David M. Heinz, Orange, and Eugene C. Whitcomb, Mission Viejo, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 27, 1975, Ser. No. 580,641
Int. Cl.[2] B01J *17/36*
U.S. Cl. 428—539 8 Claims



1. A composite comprising a monocrystalline substrate having a lattice constant which causes single crystalline lithium ferrite disposed thereon to crack, said substrate having epitaxially disposed thereon a crackfree monocrystalline layer of lithium ferrite having sodium substituted for a portion of the lithium, said film having sodium and lithium present in a molar ratio Na/Li within a range of about 0.024 to 0.268.

4,093,782

BRAZED ALUMINUM COMPOSITE

William H. Anthony; James M. Popplewell, both of Guilford, and Andrew J. Brock, Cheshire, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 3, 1977, Ser. No. 773,959
Int. Cl.[2] B32B *15/00*
U.S. Cl. 428—654 6 Claims

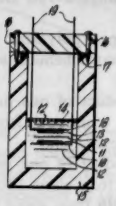
1. A brazed aluminum composite having improved resistance to intergranular corrosion comprising an aluminum alloy core material consisting essentially of from 0.05 to 0.4% chromium, from 0.2 to 0.9% manganese, up to 0.2% iron, up to 0.1% silicon, balance essentially aluminum, clad with a brazing alloy consisting essentially of from 4 to 14% silicon, up to 3% magnesium, up to 0.2% bismuth, balance essentially aluminum wherein the core contains reduced size and population density of second phase iron containing particles and wherein a silicon rich eutectic from the cladding migrates into the core to a reduced depth, said core being substantially free from $FeAl_3$ phase.

4,093,783

NOVEL FORMULATIONS $M_2UO_2F_2$ AND THEIR USE IN ELECTROCHEMICAL CELLS

Edward T. Maas, Jr., Kendall Park; John M. Longo, New Providence, and Chin H. Chang, Edison, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 22, 1977, Ser. No. 789,813
Int. Cl.[2] H01M *14/00*
U.S. Cl. 429—5 34 Claims



1. A composition of matter having the formula $M_1UO_2F_2$ where each M is any alkali metal ion or mixtures thereof.

4,093,784

LITHIUM PRIMARY CELL

Joseph R. Driscoll, Dorchester, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1977, Ser. No. 828,074
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—101 12 Claims

1. In a lithium primary cell including lithium as the anode, a solution of an inorganic salt in an inorganic solvent as the electrolyte, and a current collector as the cathode, the improvement in cell performance obtained by coating the lithium anode with calcium.

4,093,785

LIGHTER LEAD STORAGE BATTERY

Günter Sassmannshausen, and Dieter Hasenauer, both of Brilon, Germany, assignors to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn, Cologne, Germany

Filed Jan. 3, 1977, Ser. No. 756,438
Claims priority, application Germany, Jan. 20, 1976, 2601975
Int. Cl.[2] H01M *6/42*
U.S. Cl. 429—149 20 Claims

1. A lead storage battery comprising in combination
a lead-sulfuric acid battery defining therein an acid space,
a plurality of plate grids disposed in said acid space and each having a grid upper part,
an acid resistant synthetic material completely covering said grid upper part and having a substantially trapezoidal shape,
a contact lug extending upwardly from one side of each of

said plate grids, respectively through said synthetic material, said synthetic material forming an upwardly extending flange range covering and acid-tightly surrounding a portion of said contact lug,

said synthetic material constitutes a synthetic material covering having at least one projection spaced from said contact lugs on an opposite end of said plate grids,

a cover being connected acid-tight with said synthetic material covering at said projection and at said flange range around said contact lugs, said cover defining openings around said contact lugs through which said contact lugs extend,

lug bridges, disposed outside of the acid space on a side of said cover remote from the acid space, connecting said contact lugs with one another.

20. A lead storage battery having an acid space, with positive and negative plates, and having contact lugs respectively connected with one another respectively by means of lug bridges, comprising in combination

a plurality of plate grids each having a grid upper part,

an acid resistant synthetic material covering said grid upper part,

a contact lug extending upwardly from said plate grids, respectively,

said synthetic material covering and acid-tightly surrounding said contact lug,

a cover being connected acid-tight with said synthetic material,

lug bridges, disposed outside of the acid space, connecting said contact lugs with one another, said lug bridges have a U-shaped cross-section with upwardly pointing legs, the latter are connected to adjacent of said contact lugs on outwardly facing surfaces of said legs.

4,093,786

1,1-BIS(TERT-BUTYLPEROXY)CYCLODODECANE

Takeshi Komai; Masaru Matsushima, and Takeshi Nakajima, all of Aichi, Japan, assignors to Nihon Yushi Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,401
Claims priority, application Japan, Oct. 22, 1974, 49-120959
Int. Cl.[2] C08F *8/06*
U.S. Cl. 526—57 **9 Claims**

1. A process for crosslinking a polymeric material which comprises treating said polymeric material with a crosslinking agent composition comprising 1,1-bis (tert-butylperoxy)cyclododecane at a pressure of 50 to 200 kg/cm^2 and at a temperature of 100° to 200° C.

4,093,787

VINYL CHLORIDE POLYMERIZATION PROCESS

Robin Henry Burgess, Hertford, and Jeffrey Chester Greaves, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 412,030, Nov. 1, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,896
Claims priority, application United Kingdom, Nov. 20, 1972, 53490/72
Int. Cl.[2] C08F *2/20*
U.S. Cl. 526—62 **7 Claims**

1. A process for the production of vinyl chloride polymers which comprises polymerizing vinyl chloride, or vinyl chloride and up to 20% by weight thereof of at least one ethylenically unsaturated monomer copolymerizable therewith, an aqueous dispersion, in a reactor having an inner wall(s) on which there has been directly deposited an insoluble layer of a cross-linked polymeric material containing polar groups and comprising a reaction product of formaldehyde and polyethylene imine.

4,093,788

METHOD FOR THE PREPARATION OF POLYVINYL CHLORIDE BY SUSPENSION OR EMULSION POLYMERIZATION

Jung Il Jin, Irvington, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 24, 1974, Ser. No. 482,176
Int. Cl.[2] C08F *2/24, 2/18*
U.S. Cl. 526—74 **10 Claims**

1. In the polymerization of an aqueous batch charge comprising a vinyl chloride monomer and an initiator in a reactor wherein the improvement comprises incorporating in said batch charge an amount of an anthraquinone sulfonate dye intermediate which is effective for reducing the polymer scale deposition on the walls of the reactor.

4,093,789

PROCESS FOR PREPARING POLYOLEFINS

Nobuyuki Kuroda; Toru Nakamura, both of Yokohama; Takeichi Shiraishi; Kazuo Matsuura, both of Kawasaki, and Mituji Miyoshi, Naka, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Jul. 15, 1976, Ser. No. 705,607
Claims priority, application Japan, Aug. 12, 1975, 50-97190
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—114 **9 Claims**

1. A process for preparing polyolefins by polymerizing or copolymerizing alpha- olefins at a temperature in the range of from 20° to 120° C and at a pressure in the range of atmospheric pressure to 70 Kg/cm.^{2}G., in the presence of a catalyst comprising a solid component and an organometallic compound component, characterized in that said solid component is obtained by copulverizing

(1) a magnesium dihalide and/or a manganese dihalide,

(2) an aromatic hydrocarbon selected from the group consisting of monocylic aromatic hydrocarbon and the halogen-and/or alkyl-substituted derivatives thereof and polycyclic aromatic hydrocarbon, the ratios of magnesium dihalide and/or manganese dihalide to said aromatic hydrocarbon being in the range of from 1:0.5 to 1:0.1,

(3) a tetravalent titanium compound represented by the general formula $Ti(OR)_nX_{4-n}$ wherein R is an alkyl, allyl, aryl or aralkyl group having 1 to 20 carbon atoms, X is a halogen atom and n is a whole number of from 0 to 4, and

(4) a trivalent titanium compound selected from the group consisting of titanium trihalides obtained by reducing titanium tetrachloride with hydrogen, aluminum, titanium or an oganometallic compound, and trivalent titanium compounds obtained by reducing tetravalent titanium alkoxyhalides represented by the general formula $Ti(OR)_nX_{4-n}$ wherein R is alkyl, allyl, aryl or aralkyl having 1 to 20 carbon atoms, X is a halogen atom and n is a whole number of from 1 to 4, with an organometallic compound of a metal of the groups I to III of the periodic table present in a molar ration with tetravalent titanium compound (3) of from 50:1 to 1:50 and in that said organometallic compound component is a mixture of

(5) a trialkylaluminum and

(6) a compound represented by the general formula AlR_nX_{3-n} wherein R is alkyl having 1 to 10 carbon atoms and may be same or different, X is halogen and $0 < n \leq 3$, said compound being present in a molar ratio with trialkylaluminum (5) of from 2:1 to 1000:1.

4,093,790

POLYPHENYLENE RESINS

William J. I. Bracke, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Jan. 5, 1972, Ser. No. 215,465
Claims priority, application France, Apr. 14, 1971, 71.13111
Int. Cl.[2] C08F *38/00*
U.S. Cl. 526—144 1 Claim

1. A normally solid, aromatic hydrocarbon soluble polyphenylene polymer prepared by polymerizing a mixture consisting essentially of phenyl acetylene and meta-diethynyl benzene, the mixture containing between 50 and 60 mol percent of meta-diethynyl benzene and 40–50 mol percent of phenyl acetylene, with a catalyst solution prepared from Al, $AlCl_3$, chlorobenzene and $TiCl_4$, in an inert solvent and under inert atmosphere at a temperature of from − 80° to 150° C.

4,093,791

PROCESS FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WITH MOLECULAR OXYGEN

Johann Bauer, and Joseph Heckmaier, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation of Ser. No. 386,724, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 812,399, Apr. 1, 1969, abandoned. This application Aug. 25, 1975, Ser. No. 607,207
Claims priority, application Germany, Mar. 29, 1968, 1770090
Int. Cl.[2] C08F *4/28, 2/20*
U.S. Cl. 526—200 3 Claims

1. A process for the production of a polymerizate of polyvinyl chloride by suspension polymerization which consists essentially of the steps of

(1) mixing vinyl chloride with water, in a ratio such that the amount of said vinyl chloride is from 20 to 50% by weight of the total weight of water and vinyl chloride, in the presence of from 0.01 to 0.5% by weight, based on the weight of said vinyl chloride, of hydroxyethylcellulose, and a gas containing molecular oxygen selected from the group consisting of air and oxygen in an amount of from 0.01 to 3% by weight of molecular oxygen, based on the weight of said vinyl chloride, as the sole polymerization catalyst or catalyst-forming substance,

(2) adjusting said mixture to a pH of from 1.0 to 7.5,

(3) heating said mixture to polymerization temperature of from 65° to 80° C and under the autogenetic pressure while under continuous agitation for a time sufficient to effect polymerization, and

(4) recovering said polymerizate.

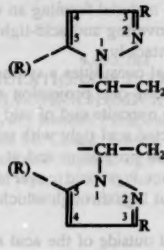
4,093,792

COPOLYMERIZATION PRODUCT OF N-VINYLMETHYLPYRAZOLE AND DIVINYL CROSS-LINKING AGENT AND METHOD OF PREPARING SAME

Alla Lvovna Bratslavskaya, ulitsa Zheleznodorozhnaya, 25a, kv. 38, Krasnogorsk Moskovskoi oblasti; Serafima Borisovna Makarova, prospekt Mira, 184, kv. 45, Moscow; Roman Yakovlevich Mushy, ulitsa Lisichanskaya, 45, kv. 15, Severodonetsk Voroshilovogradskoi oblasti; Galina Vladimirovna Myasoedova, ulitsa Fertsmana, 7, kv. 98; Sergei Borisovich Savvin, Pervaya ulitsa Stroitelei, 11, korpus 1, kv. 157, both of, Moscow, and Vera Ivanovna Seraya, ulitsa Gagarina, 56, kv. 42, Severodonetsk Voroshilovogradskoi oblasti, all of U.S.S.R.

Filed Aug. 3, 1976, Ser. No. 711,506
Int. Cl.[2] C08F *212/36, 218/14, 220/20, 226/06*
U.S. Cl. 526—200 7 Claims

1. A copolymerization product of N-vinylmethylpyrazole with a divinyl cross-linking agent said product having an elemental unit of the formula:



wherein R is a CH_3 radical in the position 3 or 5, A is a divinyl cross-linking agent selected from the group consisting of divinylbenzene, diallylmaleate, ethyleneglycol dimethacrylate, diethyleneglycol dimethacrylate and triethyleneglycol dimethacrylate and said product having a sorption capacity, in respect of platinum-group elements and silver of E_{Au}=420 to 785 mg/g of the sorbent, E_{Ag}= 320 to 450 mg/g of the sorbent, E_{Pd} = 130 to 170 mg/g of the sorbent, E_{Pt} = 180 to 230 mg/g of the sorbent and a swelling factor in water of 2 to 4 ml/g.

4,093,793

COPOLYMERS OF ANTHRAQUINONE DYES AND ACRYLAMIDE

Michel Maurice Luce Champenois, Le Mesnil Esnard, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 1, 1975, Ser. No. 601,010
Claims priority, application France, Feb. 8, 1974, 74 26846
Int. Cl.[2] C08F *212/32*
U.S. Cl. 526—221 4 Claims

1. A structurally dyed water-insoluble macromolecular material containing, in copolymerized form, acrylamide, at least one colorless monomer selected from the group consisting of vinyl chloride, vinyl acetate, styrene, acrylic acid, acrylates and acrylonitrile and at least one anthraquinone dye having a group containing a polymerizable double bond, obtained by reacting for one to two minutes, in an aqueous medium and in the presence of a tetravalent cerium complex, the dye with the acrylamide and then introducing in the medium said colorless monomer and continuing the polymerization, the amount of dye being from 0.1 to 25% by weight of the colorless monomer and the amount of acrylamide being from 0.5 to 50% by weight of the colorless monomer.

4,093,794

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Andre Chippaux, Levallois, France, assignor to Plastimer, Clichy, France

Continuation of Ser. No. 376,547, Jul. 5, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 609,831
Claims priority, application France, Jul. 21, 1972, 72.26304
Int. Cl.[2] C08F *2/20, 2/16*
U.S. Cl. 526—344 7 Claims

1. A process for the preparation of a vinyl chloride polymer composition having superior physical properties which comprises polymerizing vinyl chloride monomer under suspension or bulk polymerization conditions to form vinyl chloride polymer particles having a mean diameter of from about 10 to 500 microns, adding to the reaction medium emulsion polymerization additives at a time when the polymer particles formed are from 5 to 99% by weight of the total resultant polymer product, polymerizing under emulsion polymerization conditions the vinyl chloride monomer to produce a product having vinyl chloride polymer granules of mean diameter of from about 0.02 to 2 microns agglutinated to the surface of the suspension or bulk polymerization prepared vinyl chloride particles.

4,093,795

MULTI-STAGE ISOLATION OF HIGH PRESSURE POLYETHYLENE

Oskar Buechner, Dudenhofen; Gottfried Schlichthaerle, Neustadt, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Germany

Filed May 19, 1976, Ser. No. 687,870
Int. Cl.[2] C08F 6/26, 6/28
U.S. Cl. 528—481 6 Claims

1. A process for the manufacture of ethylene polymers by homopolymerization of ethylene or copolymerization of ethylene with other monomers which are copolymerizable with ethylene, in a polymerization zone at pressures of from 500 to 5,000 bars and at from 50° to 450° C, followed by isolation of the resulting polymer from the reaction mixture in a two-stage isolation zone at pressures in the first stage of the isolation zone of from 100 to 500 bars and in the second stage of the isolation zone of from 1 to 10 bars and at from 100° to 400° C, with mean product residence times of from 0.5 to 60 minutes in the different stages of the isolation zone, wherein the improvement comprises varying the temperature in the isolation zone to control the molecular weight of the ethylene polymer the temperature being raised to decrease the molecular weight and lowered to increase the molecular weight.

4,093,796

ANTIBIOTIC DERIVATIVES OF POLYENE MACROLIDE GROUP AND METHOD OF OBTAINING THE SAME

Leonard Falkowski, Gdansk; Miroslaw Bobrowski; Helena Buluk, both of Bialystok; Elzbieta Bylec, Gdansk; Barbara Cybulska; Jerzy Golik, both of Sopot; Pawel Kolodziejczyk, Gdansk; Jan Pawlak, Gdansk; Andrzej Rudowski, Gdansk; Jan Zielinski, Gdansk; Tadeusz Ziminski, Gdynia, and Edward Borowski, Gdansk, all of Poland, assignors to Politechnika Gdanska, Gdansk, Poland

Filed Aug. 10, 1972, Ser. No. 279,737
Claims priority, application Poland, Aug. 13, 1971, 149994; May 4, 1972, 155167
Int. Cl.[2] C07H 17/08
U.S. Cl. 536—17 19 Claims

1. The N-glycosyl reaction product of an amino group-containing polyene macrolide antibiotic obtained by reacting said antibiotic with a saccharide selected from the group consisting of aldose monosaccharides, ketose monosaccharides, aldose oligosaccharides and oligosaccharides. oligosacharides.

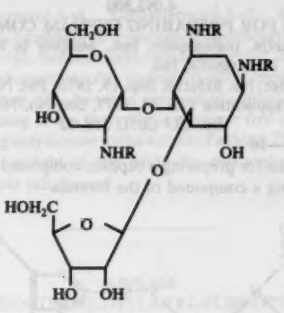
4,093,797

NOVEL AMINOCYCLITOLS AND PROCESS FOR PRODUCTION THEREOF

Takeshi Oda, Kodaira; Toshito Mori, and Takashi Yamaguchi, both of Higashimurayama, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

Filed Aug. 30, 1976, Ser. No. 718,770
Claims priority, application Japan, Sep. 3, 1975, 50/106031
Int. Cl.[2] C07H 15/22
U.S. Cl. 536—17 2 Claims

1. β-D-ribofuranosyl (1→5), O-[α-D-2-amino (or 2-acylamino)-2,3-dideoxy-glucopyranosyl (1→4)] 1,3-diamino (or 1,3-diacylamino)-1,2,3-trideoxy-myoinositol of the following formula



wherein R represents a member selected from the group consisting of hydrogen, acetyl, and an acid salt of said acetyl.

4,093,798

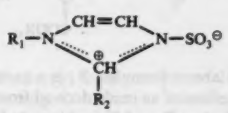
METHOD FOR PREPARING STARCH SULFATE ESTERS

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 6, 1976, Ser. No. 747,895
Int. Cl.[2] C08B 31/02
U.S. Cl. 536—48 8 Claims

1. A method for preparing sulfate esters of starch comprising the steps of:

a. reacting a starch base having free reactive hydroxyl groups with a sulfating agent selected from the group of N-alkylimidazole-N′-sulfonates corresponding to the general formula:



wherein R_1 is selected from the group consisting of lower alkyl and R_2 is selected from the group consisting of lower alkyl and hydrogen, said reaction being conducted in an aqueous medium at a pH of 11.2 to 13.0 and at a temperature of about 15 to 90° C. for a period of about 1 to 20 hours, the amount of said sulfating agent employed being from about 1 to 100%, based on the weight of dry starch; and

b. isolating the resultant starch sulfate ester.

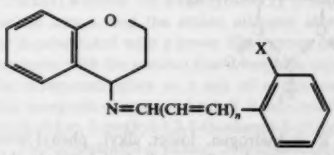
4,093,799

N-ARYLIDENE-4-CHROMANAMINES

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,104
Int. Cl.[2] C07D 311/68
U.S. Cl. 542—422 3 Claims

1. A compound of the formula:



wherein *n* is 0 or 1 and X is hydrogen or hydroxy.

4,093,800

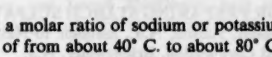
PROCESS FOR PREPARING CEPHAM COMPOUNDS

Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 615,154, Sep. 19, 1975, Pat. No. 4,024,152. This application Feb. 14, 1977, Ser. No. 768,138
Int. Cl.[2] C07D 501/02
U.S. Cl. 544—16 11 Claims

1. A process for preparing a cepham compound which comprises reacting a compound of the formula

with at least a molar ratio of sodium or potassium iodide at a temperature of from about 40° C. to about 80° C., to produce the 3-exomethylene or 3-keto cepham of the formula



in which, in the above formulae, R_1 is a carboxy protecting group; R is the residue of an imide derived from a dicarboxylic acid; R_2 is $=CH_2$ or $=O$; and X is chloro or bromo.

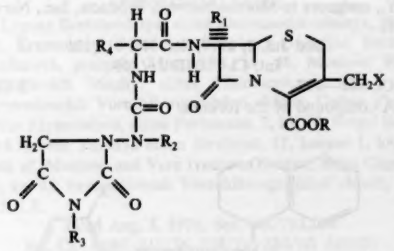
4,093,801

[[[(2,4-DIOXO-1-IMIDAZOLIDINYL)AMINO]CARBONYL]AMINO]-ACETYLCEPHALOSPORIN DERIVATIVES

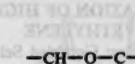
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 671,788, Mar. 30, 1976, Pat. No. 4,063,019. This application Jul. 27, 1977, Ser. No. 819,648
Int. Cl.[2] C07D 501/220, 501/36, 501/34, 501/46
U.S. Cl. 544—25 12 Claims

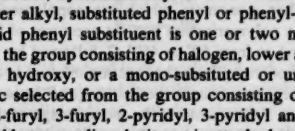
1. A compound of the formula



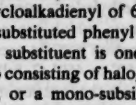
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, aluminum, alkali metal, alkaline earth metal, phenyl-lower alkylamine, lower alkylamine, tri(lower alkyl)amine, N-lower alkylpiperidine or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2, R_3 and R_5 each is hydrogen or lower alkyl; R_4 is hydrogen, lower alkyl, cyclo-lower alkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy and hydroxy, or a mono-subsituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl; R_6 is lower alkyl and X is hydrogen, lower alkanoyloxy,



or



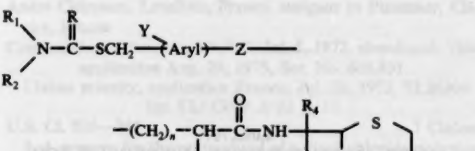
4,093,802

THIOCARBAMATEMETHYL-SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Fortuna Haviv, Montreal, Canada; Abraham Patchornik, Ness-Zione, and Janina Altman, Haifa, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 625,541, Oct. 24, 1975, Pat. No. 4,031,083. This application Jan. 14, 1977, Ser. No. 759,276
Int. Cl.[2] C07D 501/36
U.S. Cl. 544—27 31 Claims

1. A compound selected from a base of the formula:



wherein each of R_1 and R_2 is selected from hydrogen and lower alkyl of from 1 to 4 carbon atoms or NR_1R_2 taken together form a monocyclic heterocyclic group selected from pyrrolidino, piperidino and morpholino; R is oxygen or sulfur; Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when

Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with the proviso that when Aryl is 2-thienyl Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_3$ wherein R_3 is selected from hydrogen and 5-indanyl; *n* is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl, and Z is other than a bond, *n* is not zero; R_4 is selected from hydrogen and methoxy; M is selected from hydrogen, a pharmaceutically acceptable non-toxic cation; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; *p*-(alkanoyloxy)benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di- substituted with a lower alkyl group of from 1 to 4 carbon atoms; X is selected from 1,3,4-thiadiazol-5-ylthio, 3-methyl-1,2,4-thiadiazol-5-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 2-methyl-1,3,4-oxadiazol-5-ylthio, 2-methyl-1,3,4-thiadiazol-5-ylthio, and 1,2,3-triazol-5-ylthio; and pharmaceutically acceptable salts thereof.

4,093,803

7β-[2-ETHERIFIED OXIMINO-2-(THIENYL-, FURYL- OR PYRIDYLACETAMIDO)] CEPHALOSPORINS

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

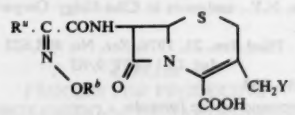
Division of Ser. No. 587,064, Jun. 16, 1975, Pat. No. 4,024,133, which is a division of Ser. No. 304,524, Nov. 7, 1972, Pat. No. 3,971,778, which is a continuation-in-part of Ser. No. 252,666, May 12, 1972, abandoned. This application Jan. 26, 1977, Ser. No. 762,927

Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 1, 1971, 45884/71

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **3 Claims**

1. A compound selected from the group consisting of a highly active cephalosporin antibiotic highly stable to β-lactamases, having the formula:



wherein R^a is thienyl, furyl, or pyridyl or any of these groups substituted by a chloro, bromo, iodo, fluoro, hydroxy, lower alkyl, nitro, amino, lower alkylamino, diloweralkylamino, lower alkanoyl, lower alkanoylamino, lower alkoxy, lower alkylthio or carbamoyl group;

R^b is phenyl, napththyl, benzyl, phenylethyl, diphenylmethyl, triphenylmethyl, thienylmethyl, furylmethyl, pyridylmethyl, pyrrolylmethyl or any of these groups substituted by a hydroxy, lower alkoxy, phenoxy, benzyloxy, carboxy, lower alkoxycarbonyl, benzyloxycarbonyl, mercapto, lower alkylthio, phenylthio, benzylthio, acetamido, benzamido, cyano, formyl, lower alkanoyl, benzoyl, amino, methylamino, ethylamino, dimethylamino, lower alkoxycarbonylamino, benzyloxycarbonylamino, phthalimido, acetoxy, propionyloxy, pivaloyloxy, chloro, bromo, iodo, fluoro, nitro, or azido group, and

Y is a group of formula -SW and W is thiadiazolyl, 5-methyl-1,3,4-thiadiazol-2-yl, diazolyl, triazolyl, tetrazolyl, 1-methyltetrazol-5-yl, 1-ethyltetrazol-5-yl, thiatriazolyl, oxazolyl, oxadiazolyl, 2-phenyl-1,3,4-oxadiazol-5-yl, benzimidazolyl, benzoxazolyl, triazolopyridyl, benzothiazolyl, nitrobenzothiazolyl, purinyl, pyridyl, pyrimidyl or an alkyl group of 1–4 carbon atoms; said cephalosporin antibiotic being in the form of a syn isomer free of the corresponding anti-isomer to the extent of at least 75% based on the total weight of said antibiotic; and a physiologically acceptable salt thereof.

4,093,804

PYRIDINIUMMETHYLARYL-SUBSTITUTED CEPHALOSPORIN DERIVATIVES

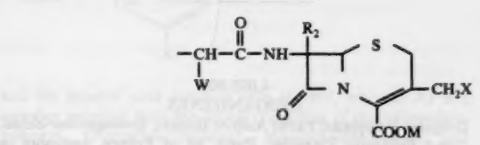
Fortuna Haviv, Montreal, Canada, and Abraham Patchornik, Ness-Ziona, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 625,570, Oct. 24, 1975, Pat. No. 4,026,887. This application Jan. 14, 1977, Ser. No. 759,466

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **36 Claims**

1. A compound selected from a base of the formula:



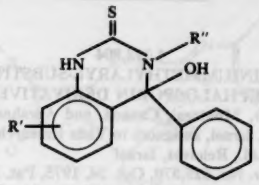
wherein Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with the proviso that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_1$ wherein R_1 is selected from hydrogen and 5-indanyl; *n* is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl, and Z is other than a bond, *n* is not zero; R_2 is selected from hydrogen or methoxy and is either cis- or trans-; M is selected from an anion; hydrogen; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; p-(alkanoyloxy)-benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms, and the amino nitrogen atom may be mono- or di-substituted with a lower alkyl group of from 1 to 4 carbon atoms; with the proviso that when M is other than an anion the compound exists as a salt of a pharmaceutically acceptable inorganic or organic acid; X is selected from 1,3,4-thiadiazol-5-ylthio, 3-methyl-1,2,4-thiadiazol-5-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 2-methyl-1,3,4-oxadiazol-5-ylthio, 2-methyl-1,3,4-thiadiazol-5ylthio and 1,2,3-triazol-5-ylthio; and pharmaceutically acceptable salts thereof.

4,093,805
4-HYDROXY-3,4-DIHYDRO-2(1H)-QUINAZOLINETHIONES

Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1977, Ser. No. 769,480
Int. Cl.² C07D 413/06
U.S. Cl. 544—116 **10 Claims**

1. A compound of the formula



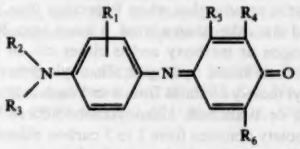
wherein R′ represents alkyl, halo, and hydrogen, and R″ represents amino, dialkylaminoalkyl, (pyrrolidinyl)ethyl, (piperidinyl)ethyl and 4-morpholinylalkyl and further including the pharmaceutically-acceptable salts thereof and wherein any alkyl refers to a moiety having from 1 to 4 carbon atoms.

4,093,806
INDOANILINES

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 619,477, Oct. 3, 1975, Pat. No. 4,046,786, which is a division of Ser. No. 482,523, Jun. 24, 1974, Pat. No. 3,929,404. This application May 20, 1977, Ser. No. 798,886
Claims priority, application Luxembourg, Jun. 22, 1973, 67860
Int. Cl.² C07D 295/14
U.S. Cl. 544—165 **10 Claims**

1. An indoaniline having the formula



wherein:

R_1 represents hydrogen, halogen, alkyl or alkoxy;

R_2 represents alkyl and hydroxyalkyl,

R_3 represents piperidinoalkyl, morpholinoalkyl or R_2 and R_3 together with the nitrogen atom to which they are attached form a heterocycle selected from piperidino and morpholino;

R_4, R_5 and R_6 each independently represent hydrogen, halogen, alkyl, alkoxy, acetylamino, ureido or carbalkoxyamino,

with the proviso that at least one of R_4, R_5 and R_6 is other than hydrogen or halogen and that at least two of said R_4, R_5 and R_6 are other than hydrogen when R_4 or R_6 is methyl and R_5 can further represent amino, alkylamino, hydroxyalkylamino and carbamylalkylamino,

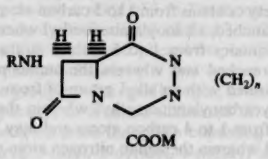
wherein the alkyl and alkoxy groups contain from 1 to 6 carbon atoms.

4,093,807
TRICYCLIC β-LACTAMS

Carl David Perchonock, Philadelphia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Jun. 27, 1977, Ser. No. 810,127
Int. Cl.² C07D 251/72
U.S. Cl. 544—183 **11 Claims**

1. A compound of the formula



where

R is phenoxyacetyl or 2-thienylacetyl,

n is 3 or 4, and

M is hydrogen, a pharmaceutically acceptable non-toxic cation, or a carboxylic acid protective ester residue.

4,093,808
PRODUCTION OF CYANURIC ACID FROM UREA

George D. Nelson, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1976, Ser. No. 752,380
Int. Cl.² C07D 251/32
U.S. Cl. 544—192 **9 Claims**

1. A process for the manufacture of crude cyanuric acid of improved purity which comprises heating in a pyrolysis zone at a temperature from about 250° C. to about 300° C., a mixture comprising:

(a) 100 parts by weight of urea;

(b) from about 20 to about 200 parts by weight, based upon the urea, of recycled cyanuric acid; and

(c) from about 3 to about 40 parts by weight, based upon the urea, of ammonium nitrate or concentrated nitric acid;

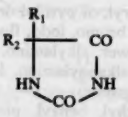
for a time sufficient to complete the pyrolysis reaction.

4,093,809
5-SUBSTITUTED PHOSPHONATE HYDANTOINS AND DERIVATIVES THEREOF

Luther A. R. Hall, Woodcliff Lake, N.J., and David A. Gordon, Scarsdale, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,623
Int. Cl.² C07F 9/65
U.S. Cl. 548—308 **21 Claims**

1. A compound of the formula

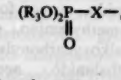


(I)

wherein

R_1 is hydrogen or alkyl of 1 to 8 carbon atoms,

R_2 is



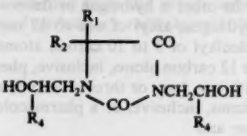
R_3 is alkyl of 1 to 8 carbon atoms, and

X is a straight or branched chain alkylene of 1 to 4 carbon atoms or a straight or branched chain alkylene of 3 to 6 carbon atoms containing an internal carbamido group, or

R_1 and R_2 together are Y where Y is a straight or branched chain alkylene of 4 to 8 carbon atoms having a pendant

moiety.

13. A compound of the formula

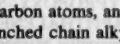


(IV)

wherein

R_1 is hydrogen or alkyl of 1 to 8 carbon atoms,

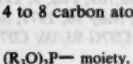
R_2 is



R_3 is alkyl of 1 to 8 carbon atoms, and

X is a straight or branched chain alkylene of 1 to 4 carbon atoms or a straight or branched chain alkylene of 3 to 6 carbon atoms containing an internal carbamido group, or

R_1 and R_2 together are Y where Y is a straight or branched chain alkylene of 4 to 8 carbon atoms having a pendant



moiety,

and

R_4 is hydrogen, methyl or ethyl.

4,093,810

PROCESS FOR PRODUCING 4-CARBOXAMIDO-5-CYANO-2-IMIDAZOLONE

Takakazu Kojima, Yamato, and Yozo Ohtsuka, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed July 26, 1976, Ser. No. 708,974

Claims priority, application Japan, Jul. 25, 1975, 50-90211

Int. Cl.[2] C07D *233/90*

U.S. Cl. 548—321 **2 Claims**

1. A process for producing 4-carboxamido-5-cyano-2-imidazolone which comprises reacting diaminomaleonitrile in the presence of a basic catalyst selected from the group consisting of a trialkylamine having 1 to 4 carbon atoms in each of the alkyl moieties thereof, triethylenediamine, hexamethylenetetramine, N-methylmorpholine, and pyridine with carbon dioxide in an organic polar solvent selected from the group consisting of dimethyl sulfoxide, N, N-dimethylformamide, an alcohol having 1 to 4 carbon atoms, tetrahydrofuran, dioxane, diethyl ether, dimethoxyethane, pyridine, acetonitrile and ethyl acetate at a temperature of from about 0° C to about 60° C.

4,093,811

2-ARYL-4-CYANOMETHYL-5-METHYLIMIDAZOLES

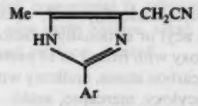
Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Continuation of Ser. No. 483,251, Jun. 26, 1974, abandoned. This application Jun. 3, 1976, Ser. No. 692,268

Int. Cl.[2] C07D *233/64*

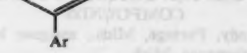
U.S. Cl. 548—342 **8 Claims**

1. A compound selected from the group consisting of 2-aryl-4-cyanomethyl-5-methylimidazole having the formula:



and mineral acid addition salts thereof, wherein Ar is a member selected from the group consisting of phenyl, methylenedioxyphenyl, loweralkanoylphenyl, loweralkylthiophenyl and phenyl substituted with 1 to 3 members selected from the group consisting of loweralkyl, loweralkoxy, halo, hydroxy, phenoxy and nitro.

8. A compound selected from the group consisting of 2-aryl-4-isopropoxymethyl-5-methylimidazole having the formula:



and the mineral acid addition salts thereof, wherein Ar is a member selected from the group consisting of methylenedioxyphenyl, loweralkanoylphenyl, loweralkylthiophenyl and phenyl substituted with 1 to 3 members selected from the group consisting of loweralkyl, loweralkoxy, halo, hydroxy, phenoxy and nitro.

4,093,812

(NITROFURYL)PYRAZOLES, THEIR SYNTHESIS AND USE, AND COMPOSITIONS CONTAINING THEM

Georg Rainer, Constance, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

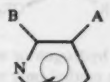
Filed Mar. 23, 1976, Ser. No. 669,611

Claims priority, application Luxembourg, Mar. 25, 1975, 72129; Feb. 20, 1976, 74400

Int. Cl.[2] C07D *231/12*; A61K *31/415*

U.S. Cl. 548—374 **85 Claims**

1. An antimicrobially-active pyrazole, the pyrazole ring of which is substituted by 5-nitro-2-furyl on a ring carbon atom ortho to one ring nitrogen atom and is unsubstituted on the ring carbon atom ortho to the other ring nitrogen atom, the pyrazole having the formula:



wherein

R^1 is directly bound to one of the two nitrogen atoms of the pyrazole ring, is heterocycle-free, and is —H, substituted or unsubstituted hydrocarbyl, carboxylic acid acyl or carbonic acid acyl, the hydrocarbyl being saturated or unsaturated, acyclic, alicyclic or aromatic, or araliphatic;

A is —CN, —CH(=X), aminol, or —C(=U)—R^{11};

U is =O, =S, =NR^3, =N—O—R^4 or =N—$N(R^7)_2$;

X is =O, =S, =N—R^3, =N—O—R^4, =N—$N(R^5)R^6$,

{—O—(lower)-alkyl}$_2$, {-S-(lower)alkyl}$_2$, —O—Y—O— or —S—Y—S—;

Y is lower alkylene with from 2 to 5 carbon atoms and optionally substituted by alkyl with from one to 5 carbon atoms;

Z is =O, =S or =NH;

R^3 is one of the meanings of R^1;

R^4 is —H, alkanoyl with from 1 to 7 carbon atoms or aroyl;

R^5 is —H or optionally-substituted alkyl;

R^6 is one of the meanings of R^7 or —C(=Z)—N(R^7)R^8;

each of

R^7 and R^8 is, independently, —H, optionally-substituted alkyl, organic acyl or optionally-substituted aryl;

R^{11} is —OH, alkoxy with from 1 to 11 carbon atoms, aryloxy with up to 12 carbon atoms, aralkoxy with up to 14 carbon atoms, halo, acyloxy, mercapto, azido, —N(R^{12})R^{13}, substituted or unsubstituted hydroxylamino or —N—H—N(R^{14})R^{15};

each of

R^{12} and R^{13} is, independently, —H, alkyl having from one to 7 carbon atoms or hydroxyalkyl having from one to 7 carbon atoms;

each of

R^{14} and R^{15}, independently, has one of the meanings of R^7; and

B is 5-nitro-2-furyl.

4,093,813

INTER-OXA-13,14-DIHYDRO-9-DEOXY-PGF COMPOUNDS

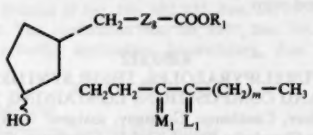
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,713

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—121 **25 Claims**

1. A prostaglandin analog of the formula



wherein *m* is one to 5, inclusive;

wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_8 is

(1) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,

(2) $—(CH_2)_2—O—(CH_2)_g—CH_2—$, or

(3) $—(CH_2)_3—O—(CH_2)_g—$,

wherein *g* is one, 2, or 3.

4,093,814

ESTERS OF 4-[3-(SUBSTITUTED AMINO)-2-HYDROXYPROPOXY]-5,6,7,8-TETRAHYDRO-1,6,7-NAPHTHALENETRIOLS

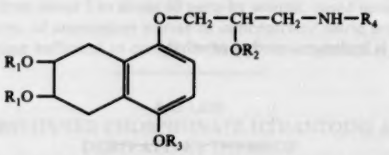
Frederic P. Hauck, Somerville; Michael E. Condon, Lawrenceville, and Rita T. Fox, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 656,769, Feb. 9, 1976, Pat. No. 4,048,231. This application May 18, 1977, Ser. No. 798,275

Int. Cl.^{2} C07G *93/06;* C07C *93/26*

U.S. Cl. 560—139 **10 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1, R_2 and R_3 are acyl, R_1 is hydrogen and R_2 and R_3 are acyl, or R_1 and R_2 are hydrogen and R_3 is acyl; and R_4 is lower alkyl; with the proviso that if more than one of R_1, R_2 and R_3 are acyl, they are the same acyl group; wherein acyl is

wherein X is alkyl having 1 to 11 carbon atoms, aryl, or aryl-lower alkyl; lower alkyl is alkyl of 1 to 4 carbon atoms; and aryl is phenyl or phenyl substituted with one or two lower alkyl, lower alkoxy, halogen or nitro groups.

4,093,815

METHOD FOR THE OXIDATION OF A CONJUGATED DIOLEFIN

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 12, 1976, Ser. No. 713,777

Int. Cl.^{2} C07C *67/05;* B01J *23/10*

U.S. Cl. 560—246 **11 Claims**

1. A method for producing diacyloxyalkenes comprising: reacting a conjugated diolefin with oxygen and at least one

compound selected from the group consisting of a carboxylic acid and a carboxylic acid anhydride using a catalyst consisting essentially of three components,

wherein said first component is a rare earth metal containing compound,

wherein said second component is an alkali metal containing compound,

wherein said third component is a halide containing compound,

wherein the number of carbon atoms in the conjugated diolefin is within a range of from about 4 to about 12, the conjugated diolefin is selected from unsubstituted compounds and substituted compounds wherein the substituents are selected from the group consisting of halogen, cyano and carbalkoxy radicals, and the carboxylic acid and carboxylic acid anhydride are selected from the group consisting of mono and dicarboxylic aliphatic and aromatic acids and acid anhydrides having from about 2 to about 18 carbon atoms per molecule,

wherein the first component is selected from the group consisting of rare earth metal oxides, carboxylates, nitrates, halides, sulfates and mixtures thereof,

wherein the second component is selected from the group consisting of alkali metal oxides, carboxylates, halides and mixtures thereof, and

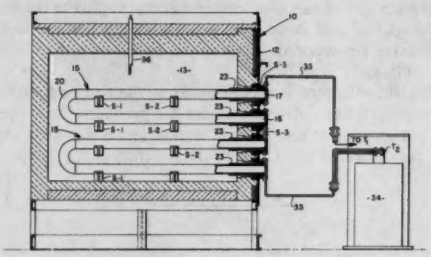
wherein the third component is selected from the group consisting of rare earth halides, alkali metal halides, organohalides and mixtures thereof.

4,093,816

FURNACE HEATING APPARATUS

Thomas L. Case, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 11, 1977, Ser. No. 767,927
Int. Cl.[2] H05B *3/10, 3/40*
U.S. Cl. 13—2 R 8 Claims



1. Heating apparatus for a furnace enclosure comprising:

a thin-walled, open-ended tube extending into and out of said enclosure;

electrical power means attached to said ends of said tube for heating said enclosure by initially passing a high amperage current of about 3800 amperes but not less than about 3000 amperes through said tube;

combustion means attached to an end of said tube for heating said enclosure by passing hot gases through said tube; and

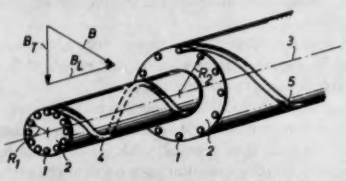
switching means for actuating said electrical power means while deactivating said combustion means without removing said combustion means from said tube and actuating said combustion means while deactivating said electrical power means without removing said electrical power means from said tube.

4,093,817

SUPERCONDUCTOR

Klaus-Peter Jüngst, and Günter Ries, both of Karlsruhe, Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Apr. 23, 1976, Ser. No. 679,879
Claims priority, application Germany, Apr. 23, 1975, 2517924
Int. Cl.[2] H01B *12/00*
U.S. Cl. 174—32 3 Claims



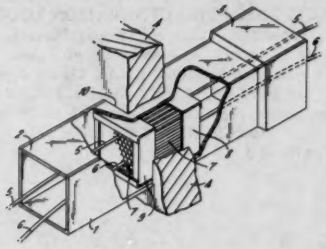
1. In a superconductor having a plurality of superconducting filaments embedded in a solid conductor of normal conducting material, said filaments being disposed on different radii within the cross section of said conductor, and each of said filaments being twisted about the longitudinal axis of said conductor and forming a helix which is concentric with respect to said longitudinal axis; the improvement wherein: each of said filaments is twisted in a first sense of rotation and then in a second sense of rotation in respective alternate sections of equal predetermined length, said second sense of rotation being opposite said first sense of rotation, whereby the coupling effects between filaments on circles of different radii produced by the components of time variable magnetic fields are suppressed.

4,093,818

FIRE-PROTECTIVE CELLULAR SERVICE DUCTING

Peter John Thwaites, Eltisley, and Dennis William Green, Stapleford, both of England, assignors to Dufaylite Developments Limited, England

Continuation of Ser. No. 642,511, Dec. 19, 1975, abandoned.
This application Aug. 13, 1976, Ser. No. 714,224
Claims priority, application United Kingdom, Dec. 20, 1974, 55237/74
Int. Cl.[2] H02G *3/22;* A62C *3/16;* E04B *1/94;* F16L *5/00*
U.S. Cl. 174—48 9 Claims



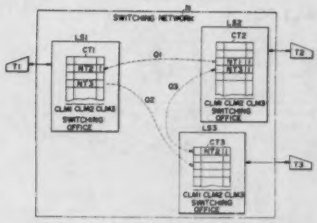
1. An assembly, for accommodating service lines, which comprises a length of ducting, a pair of metal frames each having a peripheral fit with the interior of the ducting, said frames being spaced apart in the length direction of the ducting to define a thermal conduction restricting gap between the frames, a block of structural cellular material so shaped, dimensioned and positioned as to have ends which engage within the frames and to extend from within one frame and across the position of the gap to within the other frame, said material having cell walls which define cells extending in the length direction of the ducting and permitting service lines to be passed through the block in said direction, and an intumescent material coated on said walls and being expandable to close said cells under fire conditions.

4,093,819

CLOSED USER GROUP FACILITY

Kyuta Saito, Hoya, and Fukuya Ishino, Kodaira, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,673
Claims priority, application Japan, Nov. 29, 1975, 50-143489
Int. Cl.[2] H04L *11/00*
U.S. Cl. 178—2 R 4 Claims



1. A closed user group facility having a closed user group of terminals accommodated in a switching network for transmission, comprising:

means responsive to a terminal registration request from an originating one of the terminals for registering a terminating terminal corresponding to said request with its respective one of codes with which each of the terminals accom-

modated in the switching network can be respectively identified individually;

means for verifying whether or not the codes of the originating and terminating terminals have been mutually registered; and

means for controlling the transmission of data based on the result of verification of the mutual registration of the terminal codes.

4,093,820

ELECTRONIC ECHO GENERATION EQUIPMENT

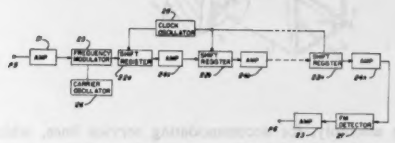
Shigeru Yamashita, Takatsuki; Kazuo Masaki, Osaka, and Masashi Shibahara, Kishiwada, all of Japan, assignors to Nihon Hammond Kabushiki Kaisha, Osaka, Japan

Filed Jul. 11, 1977, Ser. No. 814,748

Claims priority, application Japan, Jul. 16, 1976, 51-085240

Int. Cl.[2] H04R *3/00*; H03H *7/30*

U.S. Cl. 179—1 J **5 Claims**



1. An electronic echo sound generation system having a direct path and a delay path, the delay path comprising:

frequency modulation means for frequency modulating an input audio signal on a carrier and having an output;

a plurality of analog shift registers operable to time delay the modulated signal, coupled in series at a first end from the output of the frequency modulation means;

amplifier means coupled in series with the analog shift registers for compensating for the insertion losses of the analog shift registers; and

frequency modulation detector means coupled from the second end of the series coupled analog shift registers for producing at an output an echo audio signal derived from the input audio signal.

4,093,821

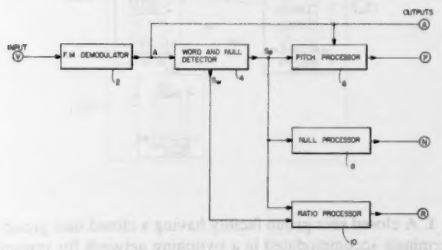
SPEECH ANALYZER FOR ANALYZING PITCH OR FREQUENCY PERTURBATIONS IN INDIVIDUAL SPEECH PATTERN TO DETERMINE THE EMOTIONAL STATE OF THE PERSON

John Decatur Williamson, Box 763, Theodore, Ala. 36582

Filed Jun. 14, 1977, Ser. No. 806,497

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SC **12 Claims**



7. A speech analyzer for analyzing an FM demodulated speech signal said analyzer comprising:

(a) detector means for receiving said FM demodulated signal and for producing a first output indicative of nulls therein and for detecting the presence of a word and producing a second output indicative thereof;

(b) pitch frequency processor means, coupled to the output of said FM demodulator and the first output of said detector means for producing an output having an amplitude proportional to the frequency of the speech signal at said nulls;

(c) pitch null duration processor means, coupled to the first output of said detector means, for producing an output having an amplitude proportional to the duration of said nulls; and

(d) ratio processor means, coupled to the first and second outputs of said detector means for producing an output proportional to the ratio of the total duration of all of said nulls within a word to the total duration of the word.

4,093,822

LOUDSPEAKER PROTECTION CIRCUIT

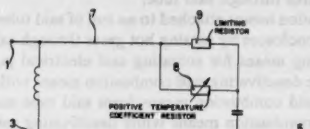
Günter Steinle, Monchweiler, Germany, assignor to Dual Gebrüder Steidinger, St. Georgen, Schwarzwald, Germany

Filed Mar. 31, 1977, Ser. No. 783,416

Claims priority, application Germany, Apr. 8, 1976, 2615305

Int. Cl.[2] H02H *3/28*

U.S. Cl. 179—1 VL **2 Claims**



1. A circuit for connection of a loudspeaker combination to an amplifier with a control device for emphasizing the amplification in the range of the treble frequencies, comprising,

a first loudspeaker means for reproduction of low and middle tone frequencies,

first electrical connection means for connecting said first loudspeaker means for reproduction of the low and middle tone frequencies to the amplifier,

a second loudspeaker means for reproduction of high-pitch frequencies,

second electrical connection means for connecting said second loudspeaker means for reproduction of the high-pitch frequencies to the amplifier,

a first resistor with positive temperature coefficient,

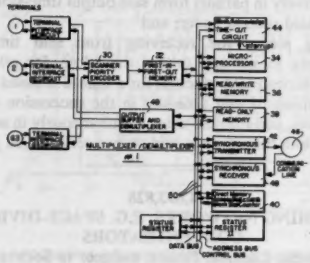
a second resistor with a fixed resistance being connected in parallel to said first resistor with positive temperature coefficient, thereby constituting a parallel resistor combination,

said parallel resistor combination being connected in series with said second electrical connection means for connecting said second loudspeaker means and substantially via said first resistor having a value which during normal operation of the loudspeaker combination is smaller than that of said second loudspeaker means for reproduction of the high-pitch frequencies, and further having a temperature coefficient such that by exceeding of a permissible constant load voltage for said second loudspeaker means its resistance value increases with respect to said second loudspeaker means such that said second loudspeaker means is not thermally overloaded, whereby said second resistor limits the resistance increase of said resistor combination to a predetermined value.

4,093,823
STATISTICAL MULTIPLEXING SYSTEM FOR COMPUTER COMMUNICATIONS

Wesley W. Chu, 16794 Charmel La., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 717,341, Aug. 24, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,802
Int. Cl.[2] H04J 3/16
U.S. Cl. 179—15 BA 49 Claims

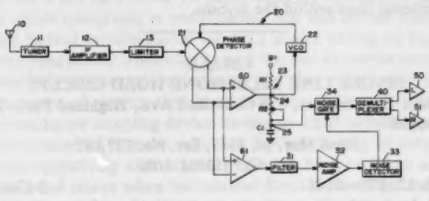


1. A statistical multiplexing system for transmitting user messages from a plurality of terminals to at least one remote location over at least one common communication channel, said system including: first buffer memory means for moderating the effects of statistically excessive demand, second buffer memory means for forming information from the first buffer memory means into data blocks, a plurality of interface circuits respectively connected to the terminal, means for introducing data from the terminals into said first buffer memory means, means for transferring said data from the first buffer memory means to the second buffer memory means, transmitter means for transmitting the data blocks from the second buffer memory means over the common communication channel to the remote location; receiver means coupled to the common communication channel for receiving multiplexed data blocks from at least one remote location over the common communication channel for distribution to the terminals; a demultiplexing circuit interposed between the receiver means and the terminal interface circuits for distributing the received data blocks, and microprocessor means for controlling the flow of signals between the first buffer memory means and the transmitter means for multiplexing the data blocks to be transmitted over the common communication channel, and for controlling the flow of signals from the receiver means to the demultiplexing circuit for demultiplexing data blocks received over the common communication channel by said receiver means.

4,093,824
RECEIVER HAVING A PHASE-LOCKED LOOP

Jon Paul Grosjean, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 15, 1976, Ser. No. 741,897
Int. Cl.[2] H04H 5/00
U.S. Cl. 179—15 BT 1 Claim



1. In a receiver having a phase-locked loop demodulator comprising a phase detector, a VCO, and a loop filter circuit for demodulating a carrier signal modulated by a baseband signal which is derived from a plurality of distinct signal components and having a demultiplexer for reconstructing said signal components, the loop filter circuit comprising:

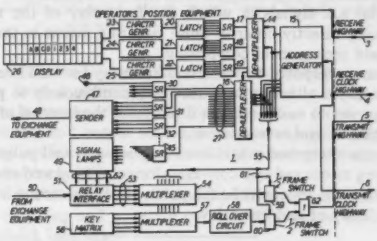
a first resistor connected between the input of the VCO and a source of potential voltage;

a resistive-capacitive branch connected between the input of the VCO and circuit ground, said branch comprising a second, variable, resistor and series-connected capacitor, wherein the loop filter circuit is characterized by a damping factor, Z, whose value is determined by the value of the variable resistive element and whereby the value of the variable resistive element is adjusted to effect optimum phase-linearity of the demodulated baseband signal, thereby allowing optimum separation of the reconstructed signal components.

4,093,825
DATA TRANSMISSION SYSTEM

David John Gladstone, Chigwell, and Peter Andrew Moldram, Aylesbury, both of England, assignors to Post Office, London, England

Filed Mar. 1, 1977, Ser. No. 773,265
Claims priority, application United Kingdom, Mar. 11, 1976, 9870/76
Int. Cl.[2] H04J 3/06
U.S. Cl. 179—15 BS 17 Claims



1. A data transmission system for transmitting data between a first unit and a second unit comprising first digital multiplex means located at said first unit and coupled via first data highway means to first digital demultiplex means located at said second unit, clock pulse generating means in the first unit connected to the first digital multiplex means to apply clock pulses thereto to effect the multiplexing of data on the first data highway means, first clock highway means connected from the clock pulse generating means to the second unit to enable clock pulses from the clock pulse generating means to be applied to the first digital demultiplex means to effect the demultiplexing of data received via the first data highway means, second digital multiplex means located in the second unit coupled by second data highway means to second digital demultiplex means located in the first unit, the second multiplex means being coupled to the first clock highway means to effect multiplexing of data on to the second data highway means in response to clock signals from the first clock highway means, and second clock highway means connected from the first clock highway means at the second unit to the first unit, the second digital demultiplex means being connected to the end of the second clock highway means at the first unit to effect demultiplexing of data received via the second data highway means in response to the clock signal received via the second clock highway means, the first unit including a first source of data which causes a signal to appear repeatediy in a particular time slot of each multiplex frame of the first multiplex means, and said second unit including a second source of data which causes a signal to appear repeatedly in a particular

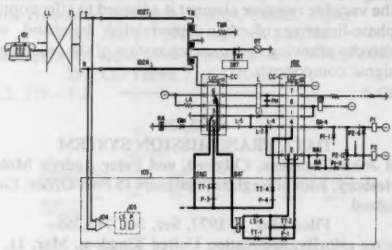
time slot of each multiplex frame of the second digital multiplex means, said particular time slots being characteristic of the data.

4,093,826

TONE SIGNALING CONVERSION APPARATUS

Frederick Henry Koster, Granite Springs, N.Y., assignor to American Telephone and Telegraph Inc., New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,832
Int. Cl.[2] H04M *3/42*
U.S. Cl. 179—16 EC **7 Claims**



1. An interface arrangement for adapting a register normally responsive to pulse signaling appearing at the register's line terminals for operation with a converter responsive to combinatorial a.c. signals in which the line relay of the register normally directly controls pulse counting means in the register, said arrangement comprising:

means interposed between said line relay and said line terminals for allowing said line relay continuously to provide power to said terminals throughout the interval of operation of said converter, and

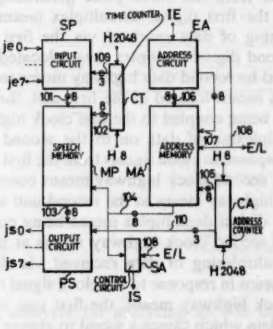
means interposed at said line relay between said pulse counting means and said converter for permitting said converter directly to control said pulse counting means independently of said line relay.

4,093,827

SYMMETRICAL TIME DIVISION MATRIX AND A NETWORK EQUIPPED WITH THIS KIND OF MATRIX

Pierre Charransol; Jacques Hauri, and Claude Athenes, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 14, 1977, Ser. No. 768,632
Claims priority, application France, Feb. 17, 1976, 76 04345; Apr. 9, 1976, 76 10566
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT **15 Claims**



1. A symmetrical time-division matrix for switching input time-slots of a first set of input series PCM junctions towards output time-slots of a second set of output series PCM junctions, said matrix comprising:

parallelizing means for receiving simultaneously in serial form said input time-slots from said input series PCM junctions and delivering successively in parallel form said input time-slots;

time-division switching means for receiving said input time-slots from said parallelizing means according to a first order, switching said input time-slots into said output time-slots according to a second order, and delivering successively in parallel form said output time-slots according to said second order; and

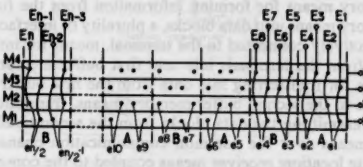
serializing means for receiving from said timedivision switching means said output time-slots, for selecting an output series PCM junction for a time-slot based solely on the position of said time-slot in the succession of output time-slots, and for delivering simultaneously in serial form said output time-slots to said output series PCM junctions.

4,093,828

SWITCHING NETWORKS, E.G. SPACE-DIVISION CONCENTRATORS

Jacques Baudin, Lannion, France, assignor to Societe Lannionnaise d'Electronique SLE-Citerel S. A., Lannion, France

Filed Oct. 6, 1976, Ser. No. 730,117
Claims priority, application France, Oct. 15, 1975, 75 31590
Int. Cl.[2] H04Q *3/42, 3/60*
U.S. Cl. 179—18 FC **14 Claims**



1. A switching network comprising a matrix of cross-point switches disposed in a pattern at selected ones of the cross-points in an array of mutually orthogonal inlets and outlets; wherein the pattern of selected cross-points is built up from a rectangular array of basic layouts each comprising eight cross-point switches distributed among the sixteen cross-points formed by a group of four consecutive inlets crossing a row of four consecutive outlets, either the group of inlets or the row of outlets being disposed in four consecutively numbered lines; the basic layouts being of two types: a first type having its switches at the end cross-points of its odd numbered lines and at the inner cross-points of its even numbered lines, and a second type having its switches at its other cross-points; basic layouts of both types being disposed in a pattern over the array in such a manner that all the cross-point switches are arranged in a single matrix, the pattern of basic layout types being a binary pattern such that the matrix has a first line of alternating types of layout, a second line of alternating pairs of layout types and so on, each n-th line having at least one set of 2^{n-1} consecutive layouts of the same type, said lines in which the layouts are disposed being parallel to said four consecutively numbered lines within the layouts.

4,093,829

SINGLE LINE TELEPHONE HOLD CIRCUIT

Robert L. Silberman, 470 Groveland Ave., Highland Park, Ill. 60035

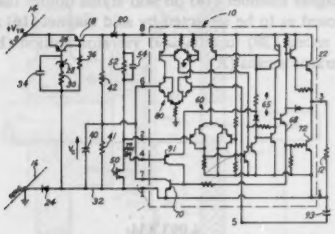
Filed Mar. 14, 1977, Ser. No. 777,067
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—81 R **2 Claims**

1. In combination with a two-wire telephone line connecting at least one telephone station set to a central exchange, an

auxiliary hold circuit for maintaining line-current when said station set is placed in an on-hook state to prevent undesired disconnection of an active call at said central exchange, said hold circuit comprising, in combination,

first and second semiconductor switching devices serially connected with a shunt impedance across said two-wire line;

means for rendering said first semiconductor switching



device conductive whenever the voltage across said two-wire line is less than a predetermined value;

manually-operated switching means for rendering said second semiconductor switching device conductive to connect said shunt impedance across said line; and

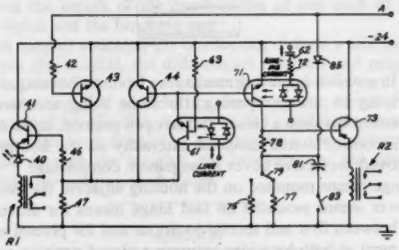
a control circuit for rendering said second device nonconductive whenever the voltage across said line exhibits a substantial decrease while said shunt impedance is connected across said line.

4,093,830

KEY TELEPHONE SYSTEM LINE CIRCUIT

Jeffrey Pappas, Morden, Canada, assignor to Vortex Design Ltd., Canada

Filed Jan. 19, 1977, Ser. No. 760,747
Int. Cl.[2] H04M 1/72
U.S. Cl. 179—99 **3 Claims**



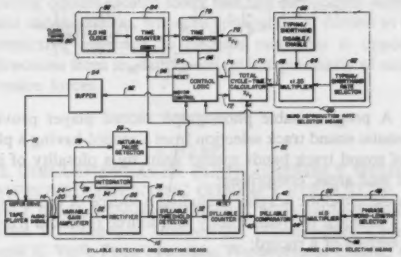
1. In combination with a key telephone system in which a telephone station-set is linked to a central exchange by at least one transmission line and in which said station-set includes switching means for applying an operating signal to a control conductor whenever said station-set is actively connected to said line, a line card circuit for supervising the operation of said line which comprises, in combination, first and second relays, a first optical semiconductor coupling device having an input circuit operatively connected to said line and an output circuit operatively connected to energize said first relay upon the occurrence of ringing signals on said line, a second optical semiconductor coupling device having an input circuit operatively connected in series with said line and having an output circuit operatively connected to energize both said first and said second relays when line current flows in said line, and a transistor switching circuit having its input connected to said control conductor for disabling said second optical semiconductor coupling device whenever said operating signal is present on said control conductor.

4,093,831

TRANSCRIBER HAVING SELECTABLE WORD REPRODUCTION RATE

Walter M. Sharp, and Gary E. Bergstrom, both of Columbus, Ohio, assignors to Business Education Products, Inc., Columbus, Ohio

Filed Oct. 12, 1976, Ser. No. 731,462
Int. Cl.[2] G11B 19/20, 27/22
U.S. Cl. 179—100.1 VC **16 Claims**



1. An apparatus for controlling the average word reproduction rate from a recording which is mounted to a playback means including an electrically operable drive motor and a sound pickup and output means, said apparatus providing an operating cycle comprising alternate playback intervals and stopped intervals and comprising:

(a) means connected to said sound pickup and output means for detecting and counting syllables reproduced during a playback interval;

(b) clock timing means for counting the elapsed time from the beginning of said cycle;

(c) rate selector means for selecting a time rate of word reproduction;

(d) circuit means connected to the outputs of said rate selector means and said syllable counter means for computing a total cycle time;

(e) time comparator means connected to the outputs of said computing circuit means and said clock timing means for signalling the coincidence of the computed cycle time and the clock time; and

(f) control logic means having a motor drive control output coupled to said drive motor and having an input connected to said time comparator means, for at times stopping said playback and for initiating playback in response to the coincidence of said elapsed time and said computed total cycle time.

11. A method for playback of a recording at a selected average word reproduction rate, said method comprising;

(a) selecting a reproduction rate;

(b) initiating and subsequently stopping the playback of a recording;

(c) counting the time elapsed from said initiating of said playback;

(d) detecting and counting the syllables reproduced during said playback

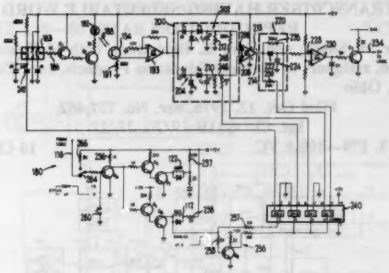
(e) computing a total cycle time by dividing said counted syllables by said selected reproduction rate; and

(f) reinitating said playback when said counted time substantially equals said computed time.

4,093,832
PROGRAMMABLE RECORD CHANGER

Anson Isaacson, Chicago; Howard J. Morrison, Deerfield, both of Ill.; Ralph H. Baer, Manchester, N.H.; Donald K. Fletchic, Arlington Heights, and Albert G. Keller, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 30, 1976, Ser. No. 682,079
Int. Cl.[2] G11B *19/14*
U.S. Cl. 179—100.4 D **39 Claims**



1. A programmable phonograph record player providing automatic sound track selection from a record having a plurality of sound track bands spaced apart by a plurality of intraband land areas, comprising:

an electro-optic scanner including a source of radiation and a detector for radiation by said source reflected from the surface of a record;

land sensing means connected to said detector and including means for developing a threshold signal which varies with the record surface reflectivity characteristics and means controlled in part by said threshold developing means for detecting the presence of a land area below the stylus by providing an output signal as said stylus encounters said land area;

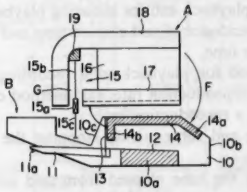
means for storing a predetermined selection of sound track bands to be played; and

control means responsive to said output signal for positioning the stylus on the record to play the preselected sound track bands as stored in said storage means.

4,093,833
MOVING COIL CARTRIDGE WITH MAGNETIC MEANS TO AFFIX STYLUS HOLDER TO CARTRIDGE CASING

Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita-Ku, Kyoto-Shi, Kyoto-Fu, Japan

Filed Jul. 13, 1976, Ser. No. 704,802
Claims priority, application Japan, Jul. 15, 1975, 50-86422
Int. Cl.[2] H04R *9/16*
U.S. Cl. 179—100.41 D **3 Claims**



1. A moving coil cartridge device comprising:

a. a vibrator section (B) including a cantilever stylus with a stylus holder case (10) and stylus holding means (10*b*, 10c) for said section;

b. a cartridge casing (40) disposed over said vibrator means (B), said cartridge casing (40) having retaining members (40*a*, 40*b*) for retaining said holding means (10*b*, 10*c*);

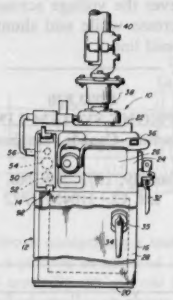
c. generator means (A) within said cartridge casing (40) for translating said stylus motion into electrical energy, said generator means (A) having a magnet (16) and yokes (17,18) with an air gap (G) for providing a magnetic field therein, a moving coil (15*a*) coupled to said vibrator section (B) in said air gap (G), a recess (20) in one of said yokes (17); and,

d. a magnet member (14) on said stylus holder case (10) so disposed as to be attracted by said magnet (16) and enter said recess (20) to affix said vibrator section (B) to said generator means (A).

4,093,834
PROTECTIVE COVER ARRANGEMENT

Norman J. Stranczek, Niles, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Jun. 30, 1976, Ser. No. 701,066
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—50 A **23 Claims**



1. In a switch operating mechanism having a housing, a door overlying an access opening, the door being mounted for movement between a closed and an open position, and a mechanism control switch mounted externally on the housing, an improved protective cover arrangement comprising:

hinge means mounted on the housing adjacent the switch;

cover means mounted on said hinge means for movement between first and second locations and for pivotal movement at both locations between a closed position overlying the switch and an open position exposing the switch;

flange means mounted on the door adjacent said cover means for engaging said cover means when said cover means is in its first location so that said cover means is retained in its closed position when the door is closed and for disengaging said cover means when said cover means is moved to its second location so that said cover means can be pivoted to its open position even when the door is closed, said flange means moving out of engagement with said cover means when the door is opened so that said cover means can be pivoted to its open position when said cover means is in its first location; and

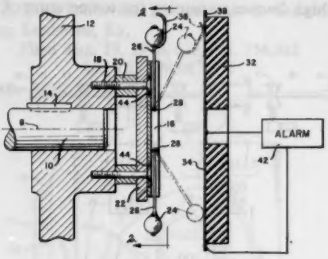
locking means on said hinge means for receiving a removable lock, the presence of the lock in said locking means preventing said cover means from being moved from its first location to its second location, and the absence of the lock in said locking means permitting said cover means to be moved to its second location.

4,093,835

ROTATION SENSOR SWITCH

John B. Sevec, Joliet, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1977, Ser. No. 784,401
Int. Cl.[2] H01H *35/02*
U.S. Cl. 200—61.45 M 3 Claims



1. A switch to operate an apparatus for providing an alarm when a rotating shaft slows comprising:

a pair of ferromagnetic weights;

a pair of electrically conducting brackets, each connected at a first end to one of the pair of ferromagnetic weights;

a pair of hinges connected in a fixed spatial relation to the shaft in a plane perpendicular to an axis of rotation of the rotating shaft and equidistant from the axis of rotation, each one of the pair of hinges connected to a second end of one of the pair of electrically conducting brackets, the hinges placed to permit rotation of the ferromagnetic weights about the hinges in a plane containing the axis of rotation of the rotating shaft, the hinges further supporting the weights in balanced rotation in a plane perpendicular to the axis of the rotating shaft;

a conducting disk disposed concentrically with and perpendicular to the axis of the rotating shaft at a distance from the plane perpendicular to the axis of the shaft that is less than the length of the combination of one each of the weights and the brackets; and

a disk magnet touching the conducting disk on a side away from the weights, the disk magnet disposed and magnetized in a direction to attract the weights toward the conducting disk whereby the ferromagnetic weights are attracted by the disk magnet to the conducting disk to make electrical contact as a switch from the conducting disk through the weights, the brackets, and the hinges when the rotating shaft slows.

4,093,836

ACCELERATION SENSITIVE SWITCH

Robert J. Ewy, Olathe, and Robert P. Moore, Lawrence, both of Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Jun. 28, 1976, Ser. No. 700,501
Int. Cl.[2] H01H *35/14, 67/02*
U.S. Cl. 200—61.53 3 Claims

1. An acceleration sensitive device comprising:

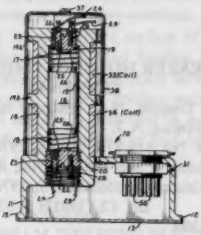
a housing having a spool-type post with a bore;

a ferromagnetic mass supported within said bore for movement therein along an axis of acceleration;

a pair of springs engaging said housing and opposite ends of said mass in a manner to resiliently urge said mass toward a preselected stable position along said axis of acceleration, said mass being displaceable in both directions along said axis of acceleration in response to acceleration and deceleration in the direction of said axis;

indicating means providing an indication of the displacement of said mass and the direction of displacement from said stable position; and

test means for displacing said mass from its stable position independently of acceleration to test the device, said test means including a pair of conductive coils wound concentrically about said axis of acceleration between opposite ends of said post and arranged to provide respective fields



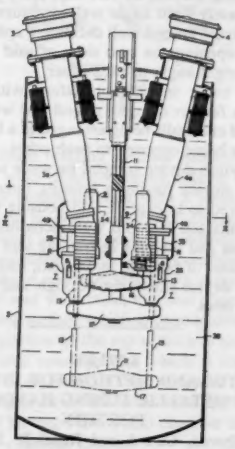
having centers located along said axis on opposite sides of said stable position, whereby application of current to the respective coils acts to displace said mass in opposite directions from its stable position independently of acceleration forces.

4,093,837

OIL CIRCUIT-BREAKER PUMP-ASSEMBLY WITH IMPROVED SHUNTING CONTACT STRUCTURE

Richard J. Bohinc, Hempfield Township, Westmoreland County; Charles W. Tragesser, Murrysville, Westmoreland County; Ronald E. Vaill, Penn Township, Westmoreland County, and Francis R. Racki, O'Hara Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1975, Ser. No. 600,556
Int. Cl.[2] H01H *33/92*
U.S. Cl. 200—150 G 7 Claims



1. The combination in an oil-type circuit-interrupter of an arcing-grid structure having an adjacently-disposed oil-pumping piston-assembly, said arcing grid structure having a pair of separable arcing contacts (13, 20) disposed therewithin, said oil pumping-assembly including an operating cylinder and a movable oil-driving rigid piston slidable within said operating cylinder, said movable rigid oil-driving piston having an enlarged central aperature provided therein, a rigid piston rod for driving said piston and actuated externally of the oil-pumping piston assembly, said piston rod extending with clearance through the enlarged hole provided in the rigid movable piston, and a resilient connection provided between the rigid

piston-rod and the movable rigid piston including one or more resilient washers surrounding said rigid piston rod and disposed on both sides of said enlarged hole in the piston for accommodating misalignment between the bore in the surrounding operating cylinder and the movable rigid piston for uninhibited smooth circuit-breaker operation.

4,093,838

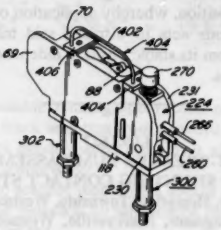
CIRCUIT BREAKER HOUSING, GRIP MEANS AND BUS TERMINAL

Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Division of Ser. No. 519,874, Nov. 1, 1974, Pat. No. 3,955,162, which is a division of Ser. No. 384,702, Aug. 1, 1973, Pat. No. 3,863,042. This application Jan. 7, 1976, Ser. No. 646,988

Int. Cl.² H01H 9/02

U.S. Cl. 200—303 **1 Claim**



1. A circuit breaker comprising

a case defining a chamber enclosing a linkage, separable contacts and a current responsive electro-magnetic means for opening said contacts on predetermined electrical conditions,

said case being formed by two half-cases and including an approximately right angle wall structure defined by two side walls and an end wall defining a space therebetween and two openings on two sides of said case at approximately a right angle to each other,

said space being in communication with said chamber through a further opening in said end wall,

said side and end walls being arranged in a U shape with said side walls being opposed to each other,

a unitary switch device trapped between said side walls,

said switch device having a housing interfitting with said side walls so as to capture said housing therebetween,

said side walls and said end wall including complementary projections and recesses restraining said switch device in all directions of possible movement, and

said switch device extending through said two openings of said two sides.

4,093,839

APPARATUS AND METHOD FOR INDUCTIVELY HEATING METALLIC TUBING HAVING AN UPSET PORTION

Louis J. Moliterno, Girard, and Reuel E. Jennings, Warren, both of Ohio, assignors to Ajax Magnethermic Corporation, Warren, Ohio

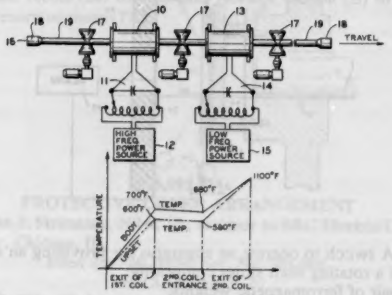
Filed Apr. 2, 1976, Ser. No. 672,981

Int. Cl.² H05B 5/06

U.S. Cl. 219—8.5 **9 Claims**

1. Apparatus for progressively inductively heating metallic tubing having at least one relatively thickened portion, comprising at least one induction heating coil energized with power at a relatively high frequency which will cause the temperature of the body of the tubing to rise at a faster rate than the temperature of said thickened portion, and at least one induction heating coil energized with power at a relatively low frequency which will cause the temperature of said thickened portion of the tubing to rise at a faster rate than the temperature of the body of the tubing, means to adjust the ratio of the power applied at said low frequency relative to the power applied at the high frequency so that said body and said thickened portion attain substantially the same predetermined final temperature upon exiting from said apparatus.

4. Method for progressively inductively heating sections of metallic tubing, each section having at least one relatively thickened portion, comprising passing said tubing through at least one induction heating coil energized with power at a relatively high frequency causing the temperature of the body



of the tubing to rise at a faster rate than the temperature of said thickened portion, and passing said tubing through at least one induction heating coil energized with power at a relatively low frequency causing the temperature of said thickened portion of the tubing to rise at a faster rate than the temperature of the body, the ratio of the power applied at said low frequency relative to the power applied at said high frequency being such that said body and said thickened portion of each section attain substantially the same predetermined final temperature upon exiting from the last of said coils.

4,093,840

PARALLEL ARRANGEMENT OF APPLICATOR AND PROCESS FOR APPLYING MICROWAVES TO A MATERIAL

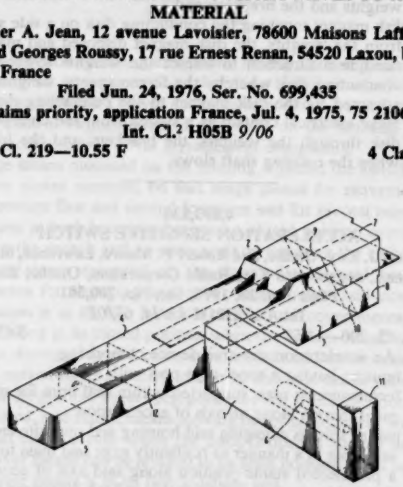
Olivier A. Jean, 12 avenue Lavoisier, 78600 Maisons Laffitte, and Georges Roussy, 17 rue Ernest Renan, 54520 Laxou, both of France

Filed Jun. 24, 1976, Ser. No. 699,435

Claims priority, application France, Jul. 4, 1975, 75 21064

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 F **4 Claims**



1. Applicator for applying microwaves to a material divided into two portions each of which has its inlet face comprising:

two waveguides electromagnetically decoupled from each other in which are respectively located said two portions,

means for generating microwaves and for sending them onto

said inlet faces so as to obtain two separate beams reflected by the inlet faces,

means for shifting the phase of said beams, so as to obtain in phase beams,

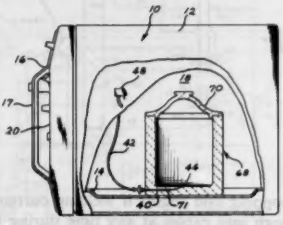
means for returning said in phase beams onto the inlet faces.

4,093,841

LOW-TEMPERATURE SLOW-COOKING MICROWAVE OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 19, 1976, Ser. No. 716,015
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **7 Claims**



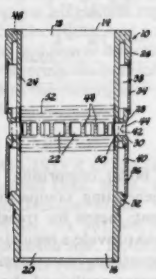
1. In a microwave oven for slow cooking, said oven having walls forming an oven cooking cavity, a source of microwave energy, and means for coupling the energy from the microwave source to the oven cavity, the improvement comprising a closed cooking vessel within the microwave oven cavity for supporting food to be heated throughout simultaneously, circuitry for adjusting the microwave energy to a predetermined reduced power level suitable for simmer-cooking and means for monitoring the temperature of the food within the vessel and maintaining it to just below the boiling point, whereby the maximum food temperature is held a plurality of hours to obtain simmer cooking at a slow-cooking rate.

4,093,842

PORTED ENGINE CYLINDER WITH SELECTIVELY HARDENED BORE

David I. Scott, Homewood, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1976, Ser. No. 649,969
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 LM **4 Claims**



1. The method of making a scuff resistant engine cylinder liner, said method comprising the steps of

providing a coolant jacketed cast iron cylinder liner body defining a generally cylindrical interior wall with a plurality of ports through said wall and spaced annularly thereabout intermediate the ends of said wall,

machining finish said liner body, including the inner surface of said wall, to form approximately cylindrical upper and lower bore portions respectively above and below said ports and an annular band at and extending slightly above and below said ports of slightly greater inner diameter than that of said upper and lower bore portions and blended into said adjacent bore portions to form a blended port relief area between said bore portions, and

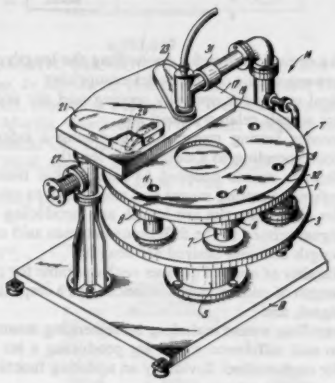
fully case hardening only the inner surface of said blended port relief area through localized heating to hardening temperature by traversing a laser beam across said inner surface and subsequent ambient cooling such that a scuff resistant hardened surface is provided in said port relief area without significant distortion of said cast iron cylinder liner body and its previously machined surfaces.

4,093,843

ELECTRON BEAM WELDING MACHINE

George Adam Lindstrom, Greenwood, and Robert Charles Holland, Danville, both of Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,621
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 EB **7 Claims**



1. An electron beam welding machine comprising:

(a) a moveable weld table containing therein a plurality of openings each communicating with a weld chamber for housing parts to be welded and each opening being provided for passing an electron beam therethrough and for evacuating said chambers to welding vacuum;

(b) a seal plate above and at least partially in contact with the top surface of said weld table; said seal plate having a flat seal and bearing surface which is coextensive with at least a substantial portion of the top surface of said weld table surrounding said openings and which is composed of a low friction, compressible, wear resistant material, said seal plate being in intimate contact with the top surface of said table and having a first pump chamber and a separate second pump chamber therein;

(c) means for moving said weld table in an indexing fashion against said seal and bearing surface;

(d) first vacuum pump means connected to the first pump chamber in said seal plate to create a vacuum in said weld chambers as such chambers are indexed into registry with said pump chamber;

(e) second vacuum pump means connected to such second pump chamber in said seal plate to at least maintain said vacuum, the arrangement being such that said seal plate is allowed to move relative to the top surface of said weld table without destroying said vacuum; and

(f) an electron beam welding gun connected to said seal plate at said second pump chamber for passing an electron beam

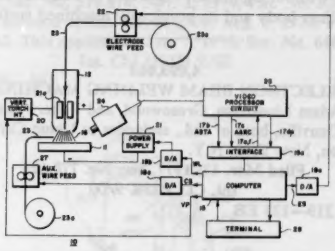
from said gun through said second pump chamber into said weld chambers for welding the parts therein.

4,093,844

ARC LENGTH MEASUREMENT AND CONTROL BY OPTICAL SCANNING

James Erwin Fellure, Heath, and Endre Leslie Toth, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Sep. 14, 1976, Ser. No. 723,362
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—124.02 **14 Claims**



1. An optical system for controlling the length of a welding arc between a pair of electrodes comprising

optical means for optically sensing said arc and producing arc signals related to said arc,

reference setting means for producing a reference signal corresponding to a desired arc length,

difference means coupled to said optical means and said reference setting means and responsive to said arc signals for measuring the arc length and producing a difference signal related to the difference between said measured arc length and said desired arc length,

a plurality of control devices each operable for changing the length of said arc in accordance with a respective set point signal, and

controlling means including incrementing means responsive to said difference signal for producing a set point signal for each control device by an updating function of a prior respective set point signal.

4,093,845

CONTROLLER FOR DC ARC WELDING GENERATORS

Nelson Hairgrove, Sr., 5411 Northington, Houston, Tex. 77039

Continuation-in-part of Ser. No. 588,200, Jun. 19, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,580
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—132 **10 Claims**

1. A controller for remotely starting and automatically stopping an internal combustion engine coupled to a DC generator that supplies DC power to the welding cables of an arc welding circuit, the engine having a starter, an ignition, and an intake manifold, comprising in combination:

a DC power source for providing a control current to said welding circuit, a current-blocking device for blocking said control current from said generator, and a current sensing device for sensing the flow of welding current,

a vacuum-actuated switching means coupled to said intake manifold and being responsive to the vacuum produced therein,

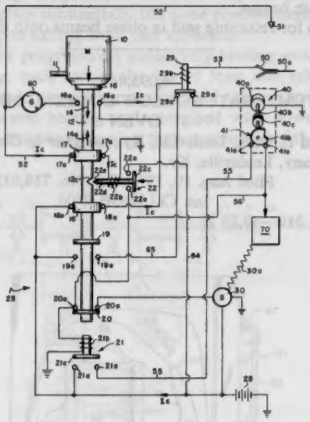
a switching circuit coupled to and controlled by said vacuum-actuated switching means,

a starter coupled to said switching circuit,

an ignition coupled to said switching circuit,

a timer having a predetermined timing interval and being coupled (1) to said switching circuit, (2) to said welding circuit, and (3) to said ignition,

said switching circuit, upon establishing continuity between said cables for said control current, energizing said ignition and said starter, thereby enabling the starting of said engine, and



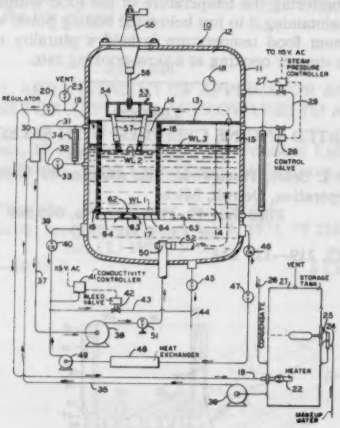
said timer stopping said engine if welding current does not flow through said cables at any time during the timing interval of said timer.

4,093,846

MULTI-JET ELECTRODE BOILER

Milton Eaton, Shawinigan, Canada, assignor to General Electric Company, Carmel, Ind.

Filed Mar. 15, 1976, Ser. No. 666,894
Int. Cl.[2] H05B *3/60*; H01C *10/02*; F22B *1/30*
U.S. Cl. 219—286 **15 Claims**



1. An electrode boiler comprising: at least one vertically elongated steam generating compartment surrounded by a control compartment; means for transferring water between said compartments to provide a regulated water level in said at least one steam generating compartment for regulating the load; jet forming means positioned above the regulated water level in said at least one steam generating compartment and formed to direct a plurality of electrode forming jets of water downwardly within said at least one stream generating compartment for impingement on the surface of the water therein; means for providing said jet forming means with a supply of water; means for connecting said jet forming means to a source of electric energy and means forming an electric neutral posi-

tioned below the minimum regulated water level in said at least one steam generating compartment; so that electric current flow through the water, including the electrodes formed by the jets of water, will heat the water.

4,093,847

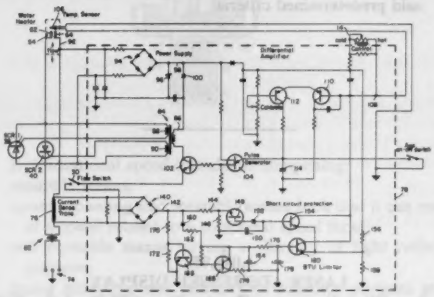
TEMPERATURE CONTROL SYSTEM FOR ELECTRIC FLUID HEATER

John A. Walker, and Dimitri S. Dimitri, both of Northridge, Calif., assignors to Datametrics Corporation, Van Nuys, Calif.

Division of Ser. No. 504,814, Sept. 10, 1974, Pat. No. 3,983,559, which is a division of Ser. No. 385,275, Aug. 3, 1973, Pat. No. 3,909,588. This application Mar. 19, 1976, Ser. No. 668,470

Int. Cl.[2] H05B *1/02, 3/60*

U.S. Cl. 219—501 **7 Claims**



1. For use with an electric fluid heater having spaced-apart electrodes for applying electrical current to a fluid, and having a temperature sensor for sensing the temperature of the fluid, an electronic temperature control system comprising:

(a) power control means connectable to the electrodes and operable for applying power to the electrodes, said power control means being responsive to application of a control signal thereto for controlling the electric power output in accordance with an electrical characteristic of the control signal; and,

(b) control circuit means connected to said power control means and adapted to be connected to the temperature sensor, said control circuit means normally generating the control signal, said control circuit means being responsive to signals from the temperature sensor for altering the electrical characteristics of the control signal whenever the temperature of the fluid varies from a preset value, said control circuit means including means for sensing the electric current supplied to the electrodes, and further including a power limiting circuit, responsive to the sensed electric current for output generating a power detection signal whose magnitude represents the power being applied to the electrodes, said control circuit means being responsive to said power detection signal exceeding a preset value for altering the control signal to decrease the power applied to the electrodes.

4,093,848

TOY CASH REGISTER CONSTRUCTION

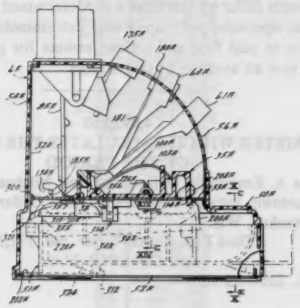
James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.

Continuation-in-part of Ser. No. 501,166, Aug. 28, 1974, Pat. No. 3,957,198. This application Apr. 19, 1976, Ser. No. 677,928

Int. Cl.[2] G07G *1/00;* **G06C** *27/00*

U.S. Cl. 235—1 E **21 Claims**

1. In a toy cash register or the like having a pair of components which comprise a housing and a drawer horizontally slidable in the housing, means biasing the drawer to a projected relation with respect to the housing, characterized by an initially straight spring wire which tends to straighten when relaxed, said wire being looped to generally circular form and secured at its two ends to one of said components and reacting against but unsecured to the other, whereby it tends to return to circular form when distorted, said looped wire being arranged under the drawer and stressed to oval shape by the



drawer and housing when the drawer is closed, said spring wire biasing the drawer to projected position due to the tendency of the wire to assume a circular shape.

4,093,849

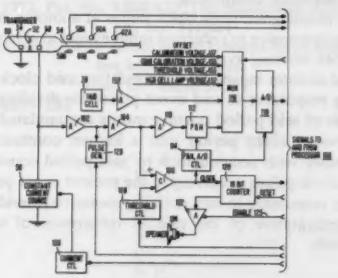
AUTOMATIC BLOOD ANALYZING SYSTEM

Robert Baxter, Jr., Stratford; Frank J. Antoci, Milford; William J. Tynes, III, Stamford; Pasquale M. Petrucci, Orange, and George F. Martin, Westbrook, all of Conn., assignors to J. T. Baker Chemical Co., Phillipsburg, N.J.

Filed Apr. 28, 1976, Ser. No. 681,285

Int. Cl.[2] G06M *11/00*

U.S. Cl. 235—92 PC **23 Claims**



1. A blood analysis system adapted to receive and analyze a blood sample comprising:

transducer means responsive to the blood sample for providing electrical pulses representative of blood cells passing therethrough;

a fluid path coupled to the transducer means and through which the blood sample flows after flowing through the transducer means;

first sensing means located along the fluid path for providing a first signal representative of the flow of a first predetermined sample volume through the fluid path;

second sensing means located along the fluid path for providing a second signal representative of the flow of a second predetermined sample volume through the fluid path;

means responsive to the electrical pulses and to the first signal for providing a first count of blood cell concentration in the first predetermined sample volume;

the means for providing said first representation being further responsive to the electrical pulses and to the second signal for providing a second count of the blood cell

concentration in the second predetermined sample volume;

means for comparing the first and the second counts to provide a determination of when said first and second counts differ by less than a predetermined difference; and

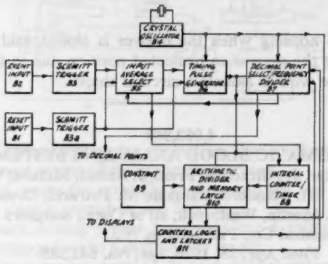
means operative only upon said determination and responsive to said first and second counts for providing as an output an average of said counts.

4,093,850

RATEMETER WHICH CALCULATES THE RECIPROCAL OF THE PERIOD

Thomas A. Karnowski, Milwaukee, and Michael W. Shawaluk, Watertown, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 22, 1977, Ser. No. 771,169
Int. Cl.[2] G01R *23/02*
U.S. Cl. 235—92 TF **35 Claims**



1. A ratemeter comprising:

clock means generating clock pulses at a known frequency;

means responsive to recurring input events to generate event pulses defining event periods;

period counter means for accumulating said clock pulses;

means responsive to said event pulses for dividing the contents of said period counter means accumulated during a previous event period into a known constant simultaneously with accumulation by said period counter means of clock pulses occurring in the present event period; and

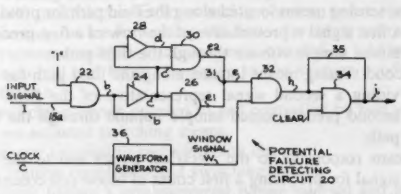
means responsive to said dividing means to provide a signal representative of the rate of recurrence of said input events.

4,093,851

MEANS AND METHODS FOR DETECTING THE POSSIBILITY OF A FAILURE OCCURRING IN THE OPERATION OF A DIGITAL CIRCUIT

Ronald Adam Paulinski, Goleta, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1976, Ser. No. 754,311
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—302.2 **11 Claims**



1. Potential failure detecting means for detecting the possibility of a potential failure occurring in a digital circuit while the circuit is operating in a data processing system in a normal manner without failure, said potential failure detecting means comprising:

means coupled to a communication line provided between said data processing system and said digital circuit for deriving a test signal indicative of a signal communicated between said digital circuit and said system during actual operation of said circuit in said system;

criteria establishing means for generating a potential failure criteria signal indicative of predetermined criteria for said test signal, said criteria signal having a predetermined timing characteristic;

comparing means for comparing time relationships between said test signal and said criteria signal; and

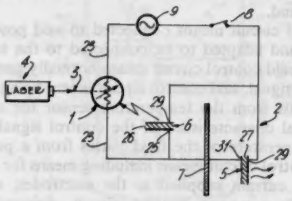
indicating means responsive to said comparing means for providing an indication of whether said test signal meets said predetermined criteria.

4,093,852

LASER ADDRESSED DISPLAY

Graham Olive, Vancouver; Royston Ernest Walter Lake, Richmond, and Joseph Guy Gilles Dionne, Ottawa, all of Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Ottawa, Canada

Filed Sep. 29, 1976, Ser. No. 727,882
Claims priority, application Canada, Jan. 30, 1976, 244634
Int. Cl.[2] H01J *31/50, 39/12*
U.S. Cl. 250—213 A **12 Claims**



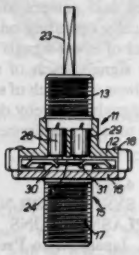
1. A photoconductor-switched electroluminescent matrix panel element for use in a laser addressed display system comprising: a photoconducting layer, deposited on a transparent substrate, electrically and optically coupled with a superimposed parallel plate capacitor structure having at least two dielectric layers with a common electrode, said dielectric layers containing phosphor particles which emit visible radiation upon excitation by an alternating electric current; said photoconducting layer having a dark impedance such that insufficient alternating current may pass through said capacitor structure to cause significant visible radiation emission and a light impedance such that when addressed by an incident light pulse provided by a laser source sufficient alternating current may pass through said capacitor structure to cause visible radiation emission; said photoconductor layer being adapted to maintain a sufficiently low light impedance, for a time period after said light pulse, to permit feedback of light emitted from one of said dielectric layers to build up and thereby sustain said low light impedance until interruption of said alternating electric current.

4,093,853

ROTATIONAL SPEED TRANSDUCERS

Norman Hunt, Leamington Spa, England, assignor to Associated Engineering Limited, Leamington Spa, England

Filed Feb. 22, 1977, Ser. No. 770,363
Claims priority, application United Kingdom, Mar. 5, 1976, 9035/76
Int. Cl.² G01D 5/34
U.S. Cl. 250—231 SE 2 Claims



1. A rotational speed transducer comprising:
rotatable means;
means mounting said rotatable means such that it can rotate at a speed related to a rotational speed input;
said rotatable means having a plurality of light reflector portions;
means mounting said plurality of reflector portions at an angle to the axis of rotation of said rotatable means;
lamp means for emitting light;
photocell means for receiving light from said lamp means and providing an electrical output in response thereto;
and means mounting said lamp means and said photocell means in relation to said rotatable means whereby to reflect light emitted by said lamp means from a first reflector portion to a second reflector portion and from said latter portion to said photocell means each time said first reflector portion comes into a given relation with said lamp means, as said rotatable means rotates, thereby to provide from said photocell means an electrical output which is a measure of the rotational speed input.

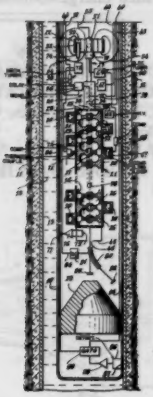
4,093,854

WELL LOGGING SONDE INCLUDING A LINEAR PARTICLE ACCELERATOR

Ronald E. Turcotte, and John S. Wahl, both of Ridgefield, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 580,071, May 22, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,403
Int. Cl.² G01V 5/00
U.S. Cl. 250—269 26 Claims

1. A method of logging the media surrounding a borehole that traverses an earth formation, comprising the steps of:
accelerating charged particles to high energy levels in a number of individual cavities containing an accelerating field;
controlling the acceleration of said particles in response to variations of at least one condition of said cavities;
bombarding a target with the accelerated particles to emit nuclear radiation that penetrates the surrounding media; and



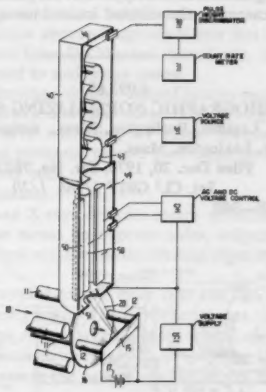
detecting nuclear radiation returning to the borehole as a result of the interaction of the emitted radiation and the surrounding media.

4,093,855

DETECTOR FOR HEAVY IONS FOLLOWING MASS ANALYSIS

Wade L. Fite, Pittsburgh, and Richard L. Myers, Harmony, both of Pa., assignors to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 465,163, Apr. 29, 1974, Pat. No. 3,973,121, which is a continuation-in-part of Ser. No. 319,442, Dec. 29, 1972, Pat. No. 3,808,433. This application Aug. 3, 1976, Ser. No. 711,231
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² H01J 39/34
U.S. Cl. 250—282 10 Claims



1. A method for detecting in macromolecular ions emerging from the exit end of a device which separates said macromolecular ions on the basis of their charge-to-mass ratios, the presence of selected elements and compounds, said method comprising the impinging of said emerging macromolecular ions having an instantaneous uniform charge-to-mass ratio upon a hot surface whereupon said macromolecular ions decompose at the high temperature of the heated surface into fragments, at least some of said fragments being surface ionizable by said hot

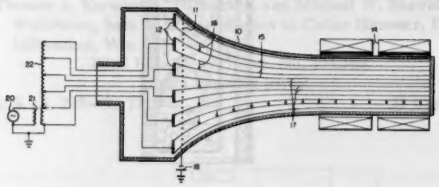
surface evolving from said hot surface as fragment ions and analyzing the fragment ions so produced by separating said fragment ions by their charge-to-mass ratios.

4,093,856

METHOD OF AND APPARATUS FOR THE ELECTROSTATIC EXCITATION OF IONS

Reiner L. Stenzel, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 9, 1976, Ser. No. 694,492
Int. Cl.[2] B01D *59/44;* H01J *39/34*
U.S. Cl. 250—293 15 Claims



1. Apparatus for imparting more energy to a selected one of the isotopes of an element in a plasma, said apparatus comprising:

(a) an elongated evacuated container having a central axis;

(b) means for generating in said container a dense, substantially electrically neutral, and substantially collisionless plasma including ions of an element having at least two isotopes;

(c) means for generating a steady magnetic field within said container, along said axis and through said plasma;

(d) a cathode and an anode in said container;

(e) said anode being disposed substantially at right angles to said longitudinal axis and consisting of at least two separate spaced sections; and

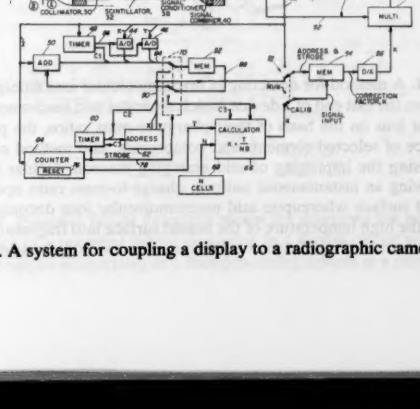
(f) means for applying a different alternating electric voltage to each section of said anode, the frequency of the alternating voltage applied to said anode corresponding to the resonant frequency of the selected isotope, whereby a varying electric field is applied to the plasma for imparting more energy to the selected ionized isotope than to other ions.

4,093,857

RADIOGRAPHIC NORMALIZING SYSTEM

Stanley N. Lapidus, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1976, Ser. No. 752,650
Int. Cl.[2] G01T *1/166, 1/20*
U.S. Cl. 250—369 6 Claims



1. A system for coupling a display to a radiographic camera producing address signals signaling the locations of radioactive events, said system comprising:

means coupled to said camera and responsive to said address signals for measuring the activity of event signals of said camera wherein each of said event signals represents the occurrence of a radioactive event in a subject being imaged by said camera, said measuring means providing activity signals including addresses of respective ones of said events which signal measures of said activity; and

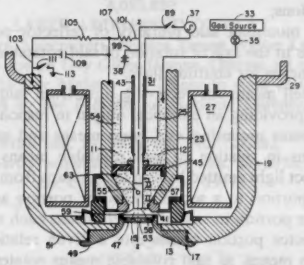
means coupled between said camera and said measuring means for mathematically operating on the relative energies of respective ones of event signals by corresponding ones of said activity signals, each of said event signals having a common address with each of said corresponding ones of said activity signals, whereby data of said subject is normalized relative to said measurement of said activity.

4,093,858

CESIUM INJECTION SYSTEM FOR NEGATIVE ION DUOPLASMATRONS

Maasaki Kobayashi, Oho, Japan; Krsto Prelec, Setauket, and Theodorus J Sluyters, East Patchogue, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,189
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—424 10 Claims



1. The method of producing negatively charged hydrogen ions, comprising the steps of:

a. forming an annular hydrogen plasma ring containing energetic hydrogen atoms in the annulus thereof;

b. interacting the hydrogen atoms and ions with a flat, circular, Cs coated metal surface in the annulus of the plasma ring to form negative hydrogen ions; and

c. maintaining the flat, circular Cs coated metal surface in an electrical potential well for extracting the negative hydrogen ions along the axis of the annular hydrogen plasma ring.

4,093,859

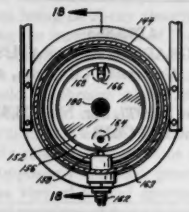
AXIAL TOMOGRAPHIC APPARATUS

Gregory A. Davis, St. Charles; Kenneth E. Krippner, St. Louis; Jan A. Roestel, Ladue; Gottfried Vonk, Maplewood, and Albert R. Zacher, Jr., University City, all of Mo., assignors to Artronix, Inc., St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,102
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—445 T 25 Claims

1. An apparatus for examination of an object having a support, means to position an object to be examined in cooperation with the support, an x-ray source mounted on the support, an x-ray detector mounted on the support in a cooperating relationship with the x-ray source and an object, the detector being positioned to receive x-rays emanating from the x-ray source and passing through the object, means to rotate the support

about the object, and means providing power connections to the apparatus, the power connection means being capable of



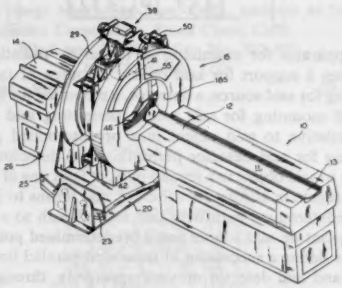
supplying power through continuous rotation of the rotating means in one rotational direction.

4,093,860

GANTRY FOR COMPUTED TOMOGRAPHY

Arnold Lloyd Kelman, Waukesha, and William Raymond O'Dell, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1977, Ser. No. 771,863
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T 2 Claims



1. A tilting gantry for x-ray tomography comprising:

a pair of generally L-shaped members spaced apart from each other in the transverse direction, each of said members comprising an upstanding leg portion and an angularly related base portion, each of said base portions having a lower edge which is cured convexly downwardly,

a downwardly convex curved track fastened to each of said base portions, the radii of curvature of each of said tracks passing through a virtual transversely extending axis which is above said tracks,

a stand fixed adjacent each of said tracks,

first and second sets of rollers supported on respective stands for rotation and said tracks being supported on said sets of rollers, respectively, for translating thereon along a curved path about said virtual transverse axis,

support means spanning between and connected with said upstanding portions of said L-shaped members,

pulley means journaled in said support means and rotatable about a longitudinally directed axis which intersects and is perpendicular to said virtual transverse axis, said pulley means being open within its circumference for permitting an examination subject to be translated along said longitudinal axis,

a rotatable base fastened to said pulley means for rotation therewith,

x-ray source and x-ray detector means mounted to said rotatable base on opposite sides of said longitudinal axis for orbiting about said axis when said base is rotated,

means for driving said pulley means rotationally, and

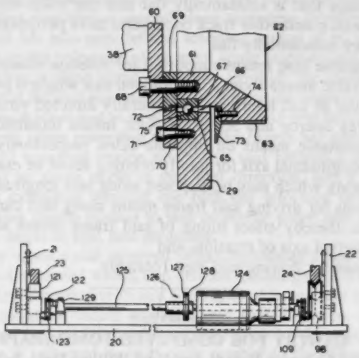
means for moving said tracks on said rollers to effect tilting of said L-shaped members.

4,093,861

GANTRY FOR COMPUTED TOMOGRAPHY

Arnold Lloyd Kelman, Waukesha, and Thomas Eben Peterson, Greendale, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,210
Int. Cl.[2] A61B *6/02;* G01N *23/08*
U.S. Cl. 250—445 T 3 Claims



1. X-ray tomographic apparatus comprising:

frame means and means for supporting said frame means for movement along a curved path about a laterally directed virtual axis to thereby enable said frame means to be tilted between opposite angles with respect to vertical,

means for driving said frame means along said curved path to thereby effect tilting of said frame means about said virtual axis of rotation,

ball bearing means having an outer race supported from said frame means and having an inner race and a plurality of balls between said races, said bearing means having a center of rotation about a longitudinal axis that is perpendicular to said laterally directed virtual axis, said outer race being fixed to said frame means,

said inner race having a single v-shaped groove encircling its outside periphery and said outer race having a single v-shaped groove encircling its inside periphery, said grooves being presented toward each other for confining said plurality of balls,

rotatable base means,

X-ray source and X-rays detector means mounted on said rotatable base means on opposite sides, respectively, of said longitudinal axis for jointly orbiting about said longitudinal axis,

pulley means coupled to said inner race and said rotatable base means being fastened to said pulley means, said pulley means and base means having aligned central openings for enabling an examination body to be disposed along said longitudinal axis in the path of the beam from said X-ray source, and

motor means and means for supporting said motor means on said frame means and means for coupling said motor means in driving relation with said pulley means.

2. X-ray tomographic apparatus comprising:

frame means mounted for movement along a curved path about a laterally directed virtual axis to thereby enable said frame means to be tilted between opposite angles with respect to vertical,

stationary support means spaced from each other in the lateral direction at opposite sides of said frame means,

a pair of curved tracks disposed downwardly convexly at

opposite sides of said frame means, respectively, and mounted on one of said frame means and said stationary support means, the radii of curvature of said tracks passing through said virtual transversely directed axis,

roller means at opposite sides, respectively, of said frame means and supported for rotation on the other of said frame means and said stationary support means for cooperating with said tracks,

one of said tracks having an edge that is substantially v-shaped in cross section and the roller means with which said track cooperates have peripheral grooves which are substantially v-shaped, the other of said tracks having an edge that is substantially flat and the roller means with which said other track cooperates have peripheries which are substantially flat,

rotatable base means supported for rotation relative to said frame means about a longitudinal axis which is perpendicular to and intersects said laterally directed virtual axis,

X-ray source and X-ray detector means mounted on said rotatable means on opposite sides, respectively, of said longitudinal axis for jointly orbiting about an examination body which may be disposed along said longitudinal axis,

means for driving said frame means along said curved path to thereby effect tilting of said frame means about said virtual axis of rotation, and

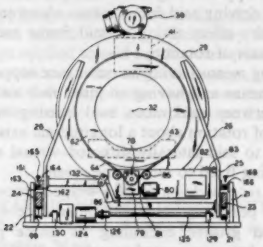
means for driving said base rotatably.

4,093,862

GANTRY FOR COMPUTED TOMOGRAPHY

Richard Thornton Brandt, and Paul William Hein, both of New Berlin, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,209
Int. Cl.[2] A61B 6/02; G01N 23/08
U.S. Cl. 250—445 T **4 Claims**



1. X-ray tomographic apparatus comprising:

frame means and means for supporting said frame means for movement along a curved path about a laterally directed virtual axis to thereby enable said frame means to be tilted between opposite angles with respect to vertical,

said means for supporting said frame means for movement including stationary support means spaced from each other in the lateral direction at opposite sides of said frame means,

curved track means disposed downwardly convexly at opposite sides of said frame means, respectively, and mounted on one of said frame means and said stationary support means, the radii of curvature of said track means passing through said virtual transversely directed axis,

roller means at opposite sides, respectively, of said frame means and supported for rotation on the other of said frame means and said stationary support means for cooperating with said track means, and

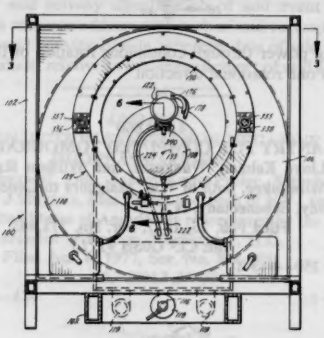
means at opposite sides of said frame means constructed and arranged for being selectively operable to lift said frame means to cause said roller means and track means to separate and to support said frame means directly from said stationary means and to lock said frame means against tilting.

4,093,863

TOMOGRAPHIC APPARATUS

Albert R. Zacher, Jr., University City, Mo., assignor to Artronix, Inc., St. Louis, Mo.

Filed Mar. 3, 1977, Ser. No. 773,833
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—445 T **24 Claims**



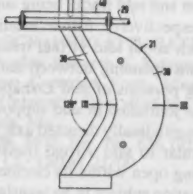
1. Apparatus for examining an object by radiation which comprises a support for said object, a source of radiation, a mounting for said source, a detector, a mounting for said detector, said mounting for said source permitting said source to move relative to said object in a predetermined path, said mounting for said detector permitting said detector to move relative to said object in a second path, at least one of said paths being arcuate in at least part thereof, and means to interrelate said predetermined path with said second path so a predetermined point on said source and a predetermined point on said detector define a succession of translated parallel lines, as said source and said detector move, respectively, throughout said predetermined path and said second path.

4,093,864

PRIMARY X-RAY DIAPHRAGM ASSEMBLY

Alfred Hahn; Ernst Steiner, and Rudolf Pospischil, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1976, Ser. No. 723,067
Claims priority, application Germany, Apr. 8, 1976, 2615335
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—505 **16 Claims**



1. In a primary X-ray diaphragm assembly for X-ray examination apparatus, including a plurality of diaphragm plates which define a cone of rays, said diaphragm plates being adjustable in a direction generally perpendicular to a symmetry axis of the diaphragm plates and being rotatable about the symmetry axis, said diaphragm plates having cooperating front

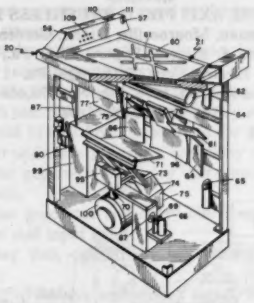
edges for defining a diaphragm aperture with respect to an aperture plane perpendicular to the direction of transmission of X-ray energy in said cone of rays, said front edges of said diaphragm plates being of X-ray absorbing material for relatively attenuating the transmission of X-ray energy impinging on said edges in comparison to the cone of rays transmitted by such diaphragm aperture, and motorized drive mechanism coupled with said diaphragm plates for adjusting said diaphragm plates relative to one another to vary the size of said diaphragm aperture, said edges of said diaphragm plates including angularly related edge sections and central edge sections defining oppositely directed generally V-shaped edge configurations as viewed in said aperture plane with the V-shaped edge configurations opening toward the symmetry axis, the angularly related edge sections of each V-shaped edge configuration having an angle therebetween in the range from about 50° to about 150°, and the central edge section of each V-shaped edge configuration being rounded for defining diaphragm apertures accommodating distinctly rounded contours, said motorized drive mechanism having means for selectively individually adjusting one only of the respective diaphragm plates while the other diaphragm plate remains stationary.

4,093,865

CODE SYMBOL SCANNER USING A DOUBLE X BAR PATTERN

Franklyn George Nickl, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 29, 1977, Ser. No. 792,393
Int. Cl.[2] G06K 7/10
U.S. Cl. 250—566 **23 Claims**



1. A system for scanning a code symbol consisting of a combination of spaced parallel bars affixed to an object for providing coded information related to said object, and for providing an electrical signal indicative of said coded information in response to scanning said code symbol, comprising

a housing for defining a scanning region adjacent the housing for receiving objects having said code symbol;

means for providing a light beam;

means for scanning said light beam in a predetermined scanning pattern within said defined scanning region;

means for detecting light having at least a predetermined intensity and for providing an electrical signal in response to detection of said light; and

means for directing light from said scanned light beam that is reflected from a said code symbol on a said received object to the detecting means; characterized by

the scanning means including an optical system for scanning said light beam at an acute angle to a reference plane defining a boundary of said defined scanning region and in a predetermined scanning pattern that includes

a first bar in said reference plane extending normal to a first direction;

second and third bars in said reference plane disposed along lines that intersect with each other and disposed symmetrically in relation to the first bar; and

fourth and fifth bars in said reference plane disposed along lines that intersect with each other and disposed symmetrically in relation to the first bar;

wherein the second and third bars intersect with each other and/or the fourth and fifth bars intersect with each other; and

wherein the second bar intersects with the fifth bar and the third bar intersects with the fourth bar; and said pattern further includes

a first plane extending through the first bar into said defined scanning region at an acute angle to said reference plane in said first direction, a second plane extending through the second bar into said defined scanning region at an acute angle to the reference plane at an acute angle to said first direction, a third plane extending through the third bar into said defined scanning region at an acute angle to said reference plane and at an acute angle to said first direction, a fourth plane extending through the fourth bar into said defined scanning region normal to said reference plane and at an acute angle to said first direction, and a fifth plane extending through the fifth bar into said defined scanning region normal to said reference plane and at an acute angle to said first direction,

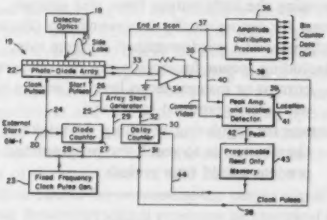
whereby when a said received object containing a said code symbol is moved within said defined scanning region from said first direction with said code symbol facing said reference plane or facing opposite said first direction, light scanned into said defined scanning region by the scanning means is reflected by said code symbol to the detecting means, and the detecting means provides an electrical signal indicative of said coded information.

4,093,866

DIFFRACTION PATTERN AMPLITUDE ANALYSIS FOR USE IN FABRIC INSPECTION

Harvey Lee Kasdan, Van Nuys, and Donald Carleton Mead, Granada Hills, both of Calif., assignors to Greenwood Mills, Inc., Greenwood, S.C.

Continuation of Ser. No. 673,887, Apr. 5, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 806,827
Int. Cl.[2] G01N 21/32
U.S. Cl. 250—563 **14 Claims**



1. A method of analyzing the shape of the amplitude envelope of a light lobe including the steps of:

a. scanning the light intensity of the lobe from one side of the lobe to the other to provide successive voltage signals whose respective voltage values are a function of the light intensity at successively spaced increments from the one side to the other;

b. providing a series of reference voltages of substantially less number than the number of spaced increments, each reference voltage having a value greater than the value of the preceding reference voltage in the series to define a voltage range encompassing the highest voltage in said series of voltage signals;

c. comparing each successive voltage signal with all of said reference voltages simultaneously; and

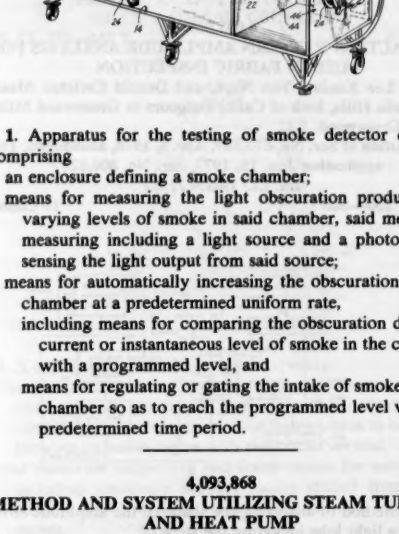
d. providing a numerical count of those voltage signals which have voltage values falling between the values of adjacent reference voltages in said series of reference voltages so that a plurality of counts is provided which indicates the amplitude distribution of light in said light lobe, said plurality of counts being substantially less in number than the number of spaced increments thereby reducing storage data requirements in the analysis of the amplitude envelope of said light lobe.

4,093,867

APPARATUS FOR AUTOMATICALLY CALIBRATING AND TESTING SMOKE DETECTORS

Mahesh J. Shah, Bridgeport, and Joseph P. Mallozzi, Norwalk, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Oct. 27, 1976, Ser. No. 736,036
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—576 **13 Claims**



1. Apparatus for the testing of smoke detector devices, comprising

an enclosure defining a smoke chamber;

means for measuring the light obscuration produced by varying levels of smoke in said chamber, said means for measuring including a light source and a photocell for sensing the light output from said source;

means for automatically increasing the obscuration in said chamber at a predetermined uniform rate,

including means for comparing the obscuration due to a current or instantaneous level of smoke in the chamber with a programmed level, and

means for regulating or gating the intake of smoke to said chamber so as to reach the programmed level within a predetermined time period.

4,093,868

METHOD AND SYSTEM UTILIZING STEAM TURBINE AND HEAT PUMP

John I. Manning, 22 N. Grand St., Cobleskill, N.Y. 12043

Filed Apr. 29, 1974, Ser. No. 464,850
Int. Cl.[2] F24D *9/00*
U.S. Cl. 290—2 **12 Claims**

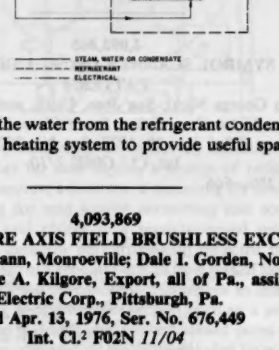
1. A method of conjointly operating a steam turbine generating plant and a mechanical compression heat pump for heating duty comprising:

(a) providing water from a source at ambient temperature to the steam condenser of the generating plant;

(b) providing at least a portion of the water discharged from the steam condenser to the chiller of the heat pump for extraction of heat from such water by evaporation of refrigerant in the chiller;

(c) discharging the water from the chiller back into said source;

(d) circulating water returning from a space heating system through the refrigerant condenser, thereby raising the temperature of such water; and



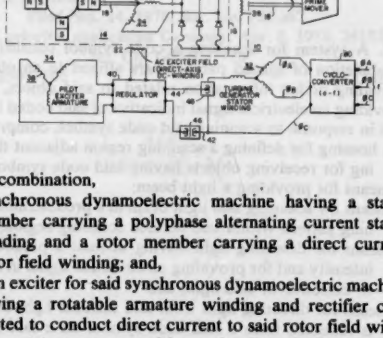
(e) circulating the water from the refrigerant condenser back to the space heating system to provide useful space heating.

4,093,869

QUADRATURE AXIS FIELD BRUSHLESS EXCITER

Arthur H. Hoffmann, Monroeville; Dale I. Gorden, North Versailles, and Lee A. Kilgore, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1976, Ser. No. 676,449
Int. Cl.[2] F02N *11/04*
U.S. Cl. 290—31 **10 Claims**



1. In combination,

a synchronous dynamoelectric machine having a stator member carrying a polyphase alternating current stator winding and a rotor member carrying a direct current rotor field winding; and,

a main exciter for said synchronous dynamoelectric machine having a rotatable armature winding and rectifier connected to conduct direct current to said rotor field winding, a stator core comprising a plurality of salient poles, a plurality of field coils disposed on selected ones of said salient poles, said field coils being connected together to constitute a direct current stator field winding, and at least one starting coil interposed between salient poles, the magnetic axis of said starting coil being disposed substantially in space-quadrature relation with respect to the magnetic axes of adjacent field coils, said starting coil

being disposed to induce alternating current in said armature winding when said starting coil is energized by a single phase alternating current source.

4,093,870
APPARATUS FOR TESTING REFLEXES AND/OR FOR FUNCTIONING AS A COMBINATION LOCK

Lawrence J. Epstein, 4216 Shoreclub Dr., Mercer Island, Wash. 98040

Filed Apr. 26, 1976, Ser. No. 680,217
Int. Cl.[2] B60R *25/04*
U.S. Cl. 307—10 R **10 Claims**

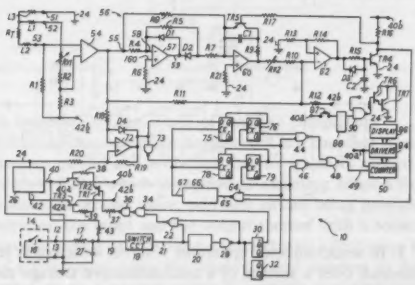
1. An electronic control apparatus comprising:
a. an input gate;
b. a first storage unit;
c. said input gate and said first storage unit connecting with each other;
d. an output gate for producing an unlock signal;
e. said first storage unit and said output gate connecting with each other;
f. a second storage unit connecting with said output gate to receive said unlock signal;
g. a first counter operatively connecting with said second storage unit;
h. a clear gate;
i. said first counter and said clear gate connecting with each other;
j. a second counter connecting with said clear gate;
k. a third counter connecting with said clear gate;
l. said clear gate connecting with said first storage unit;
m. said clear gate being capable of clearing said second counter and said third counter and said first storage unit;
n. said first counter and said second counter connecting with said input gate to send a signal to the input gate;
o. a third storage unit;
p. an input device connecting with said third storage unit;
q. a pulse generator and delay unit;
r. said third storage unit connecting with said first counter and with said pulse generator and delay unit for sending a first signal to said first counter and for sending a second signal to said pulse generator and delay unit;
s. said pulse generator and delay unit connecting with said input gate;
t. said pulse generator and delay unit controls the second signal to said input gate;
u. a display unit, operatively, connecting to the second counter;
v. a device to receive said unlock signal, operatively, connecting with said second storage unit;
w. a clock connecting with the second counter;
x. said second storage unit receives said unlock signal and controls said device; and
y. said first counter, operatively, connecting with said output gate to clear said unlock signal.

4,093,871
CORRECTION CIRCUIT

George Arthur Plumb, Lower Withington; John Leo Thomas Bushell, Cheadle Hulme, and Patrick Louis Radford, Stockport, all of England, assignors to P.C. Compteurs Limited, Cheadle Hulme, England

Filed Oct. 6, 1976, Ser. No. 730,033
Claims priority, application United Kingdom, Oct. 8, 1975, 41130/75
Int. Cl.[2] H02K *3/00, 3/64*
U.S. Cl. 307—106 **8 Claims**

1. A correction circuit for correcting the output signal produced by a fluid flowmeter which produces an electrical pulse output signal at a pulse repetition rate which is representative of the volumetric flow rate of the fluid whose flow rate is being measured by the flowmeter, said correction being effected in dependence upon at least one parameter of said fluid, the circuit comprising:
a first input for receiving the output signal produced by the flowmeter,
a second input for receiving an input signal representative of the magnitude of said parameter,
first circuit means responsive to the flowmeter output signal at the first input to generate a first pulse train at a first average pulse repetition rate which is dependent upon said pulse repetition rate of the flowmeter output signal,
a difference circuit responsive to the input signal at the second input to generate an auxiliary signal whose magnitude is dependent upon the difference between the magnitude of said parameter and a reference magnitude of said parameter,
means responsive to said first average pulse repetition rate and to the magnitude of the auxiliary signal to increase the number of pulses in the first pulse train by adding auxiliary pulses thereto at a rate dependent upon the magnitude of said difference when said difference is of one polarity, and to decrease the number of pulses in the first pulse train by blocking a fraction thereof at a rate dependent upon the magnitude of said difference when said difference is of the other polarity, whereby the pulse adding and blocking means produces an output pulse train at a second average pulse repetition rate which is representative of the volumetric flow rate of the fluid corrected for variations in said parameter,
an oscillator for producing test pulses of predetermined frequency,



switch means for applying the test pulses to the first circuit means in place of the flowmeter output signal, and
counter means arranged to count the number of pulses produced by the pulse adding and blocking means during an internal defined between a selected one of two successive adding operations and two succesive blocking operations of the pulse adding and blocking means, whereby the count in said counter means at the end of said interval is indicative of the magnitude of said difference.

8. A correction circuit for correcting the output signal produced by a fluid flowmeter which produces an electrical pulse output signal whose pulse repetition rate is representative of the volumetric flow rate of the fluid whose flow rate is being measured by the flowmeter, said correction being effected in dependence upon at least one parameter of said fluid, the circuit comprising:
a first input for receiving the output signal produced by the flowmeter,
a second input for receiving an input signal representative of the magnitude of said parameter,
first circuit means responsive to the flowmeter output signal at the first input to generate a first pulse train whose average pulse repetition rate is dependent on the pulse repetition rate of the flowmeter output signal,
second circuit means responsive to the input signal at the second input to generate a second pulse train whose aver-

age pulse repetition rate is dependent on the magnitude of said parameter,

means for combining said first and second pulse trains so as to produce an output pulse train whose average pulse repetitive rate is representative of the volumetric flow rate of the fluid corrected for variations in said parameter,

a power supply which, in operation, is continuously connected to energize a first portion of the circuit, said first portion being arranged to consume a relatively small proportion of the power required by the circuit, and

switching means connected to the power supply and responsive to each pulse of the flowmeter output signal to energize the remainder of the circuit for a relatively short period, whereby to reduce to total power required by the circuit.

4,093,872

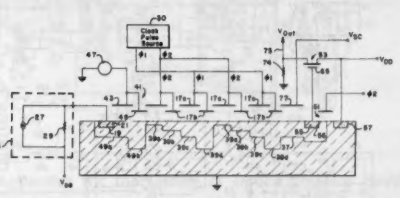
CHARGE COUPLED DEVICE WITH INPUT FOR DIRECT INJECTION OF SIGNAL

John M. Hartman, Costa Mesa, and Darrell M. Erb, Newport Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 436,587, Jan. 25, 1974, abandoned. This application Sep. 2, 1975, Ser. No. 609,774

Int. Cl.[2] G11C *19/28;* H01L *29/78, 27/14, 31/00*

U.S. Cl. 307—221 D **8 Claims**



1. In semiconductor apparatus wherein a dielectric layer is disposed over a surface of a semiconductive storage medium and a series of electrodes are disposed in or over said dielectric layer for causing a series of potential wells to be formed in response to voltages applied to said electrodes periodically, said potential wells being adapted to store packets of electric charge, said electrodes being operable in response to said voltages to transfer said charge packets along said potential wells, the improvement whereby charge may be injected directly into said storage medium comprising:

(a) means for injecting charge into said storage medium near at least one of said potential wells;

(b) means connected to said injecting means for generating an analog signal so as to cause a charge proportional to said analog signal to be injected into said substrate through said injecting means;

(c) an electrode structure disposed between said injecting means and said at least one potential well; and

(d) a steady bias voltage source connected to said electrode structure, said electrode structure including a transfer portion nearest said injecting means and a storage portion nearest said at least one potential well and non-overlapping with said injecting means, said electrode structure and said steady bias voltage being arranged so as to maintain a potential well under said electrode structure which is deeper under said storage portion than it is under said transfer portion whereby said charge injected through said injecting means is temporarily stored under said storage portion, isolated from said injecting means.

4,093,873

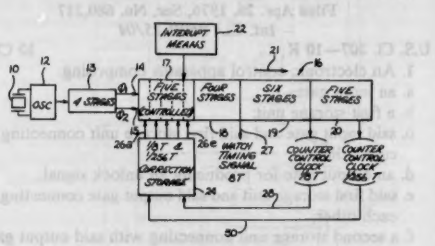
COMPENSATING DIGITAL COUNTER FOR QUARTZ CRYSTAL OSCILLATOR

Jerald W. Vannier, Santa Clara, and Gary T. Bastian, Cupertino, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 28, 1976, Ser. No. 736,377

Int. Cl.[2] H03K *21/00*

U.S. Cl. 307—223 R **17 Claims**



1. A digital counter for providing compensated timing signals comprising:

a frequency reference source;

storage means for providing a predetermined digital number;

a plurality of counter stages coupled to said frequency reference source for reducing the frequency of said source to a lower frequency, said plurality of counter stages including a first group of counter stages which are coupled to said storage means;

interrupt means for interrupting the flow of signals through at least one of said plurality of counter stages;

control means coupled to said interrupt means, said storage means, and said plurality of counter stages for controlling said interrupt means and said storage means such that the count in said first group of counter stages is selectively made a function of said predetermined number;

said predetermined number causing lesser counting in said counter stages for a slow one of said frequency source and additional counting for a fast one of said frequency source, said predetermined number being introduced into said first group of stages when said interrupt means interrupts said flow of said signals;

whereby compensation may be provided for a fast or a slow frequency source.

4,093,874

CONSTANT IMPEDANCE MOSFET SWITCH

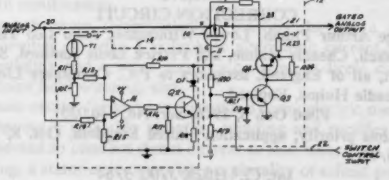
Glenn A. Pollitt, Burnaby, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Dec. 29, 1976, Ser. No. 755,422

Claims priority, application Canada, Feb. 10, 1976, 245393

Int. Cl.[2] H03K *17/12, 17/14, 17/68;* H03G *3/30*

U.S. Cl. 307—251 **4 Claims**



1. Apparatus comprising:

(a) MOSFET switching means having first and second mutually exclusive conductive states, said first conductive state characterized by an internal resistance R_{ON} and said second conductive state characterized by an internal resis-

tance R_{ON} wherein $R_{OFF} >> R_{ON}$, said means also having a source electrode for receiving an analog signal, a drain electrode for transmitting an output signal proportional to the analog signal when the means is in the first state, a gate electrode and a substrate electrode;

(b) bias means having an input, and a first, second, and third output, said input for receiving an external control signal, and first, second, and third outputs connected to said gate, substrate and source electrodes respectively, said bias means, in the presence of the external control signal, applying appropriate bias voltages to the switch means to place the switch means in the appropriate one of first and second conductive states; and

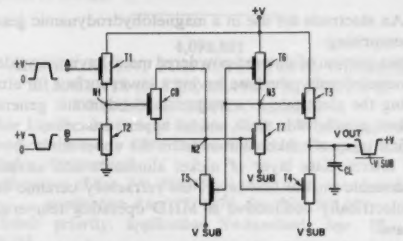
(c) compensation means having an input connected to said source electrode and an output connected to said gate electrode, said compensation means providing in the absence of said analog signal a compensating voltage across said electrodes such that the magnitude of R_{ON} remains constant despite ambient temperature variations, and said compensation means in the presence of the said analog signal providing a compensating voltage across said electrodes such that the magnitude of R_{ON} remains constant despite analog signal variations.

4,093,875

FIELD EFFECT TRANSISTOR (FET) CIRCUIT UTILIZING SUBSTRATE POTENTIAL FOR TURNING OFF DEPLETION MODE DEVICES

Ronald William Knepper, La Grangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,494
Int. Cl.[2] H03K *17/60, 17/04*
U.S. Cl. 307—251 **18 Claims**



1. A field effect transistor circuit, formed on a semiconductor substrate comprising:

first, second, and third sources of potential having potentials of unequal magnitude;

an input stage having at least a first pair of field effect transistors connected in electrical series between said first and second sources of potential;

an output stage having at least a second pair of field effect transistors connected in electrical series between said first and third sources of potential; and

means coupling said input stage to said output stage having at least a third pair of field effect transistors connected in electrical series between said first and third sources of potential;

said input stage having an output from a circuit point between said first pair of field effect transistors to said means coupling, and also electrically coupled to at least one of said third pair of field effect transistors;

said means coupling having an output electrically coupled from a circuit point between said third pair of field effect transistors to at least one of said second pair of field effect transistors;

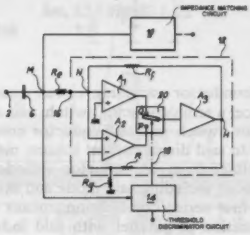
whereby a binary logic signal having stable potential levels approximating said first and second sources of potential, applied to said input stage, provides a binary logic output signal having stable potential levels approximating said first and third sources of potential at an output of said output stage, said third source of potential being derived from the substrate.

4,093,876

BASELINE RESTORER CIRCUIT

Kamal Labib Henein, Evry, and Vsevolod Goursky, Paris, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 5, 1977, Ser. No. 757,016
Claims priority, application France, Jan. 12, 1976, 76 00607
Int. Cl.[2] H03K *1/14, 5/08*
U.S. Cl. 307—264 **16 Claims**



1. A baseline restorer circuit of the type comprising:

a first circuit having an input connected to a coupling capacitor, an output and a control lead to which is applied a control signal which is capable of assuming either a first value or a second value, said first circuit being provided between the input and the output thereof with a resistor having a value of resistance equal either to a first value R_0 of a low order when the control signal assumes its first value or to a second value R_∞ which is considerably higher than R_0 when the control signal assumes its second value,

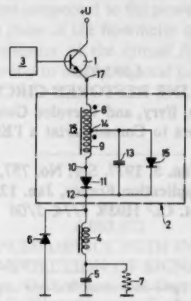
a second circuit of the threshold discriminator type whose input is connected to the input of the first circuit aforesaid and whose output is connected to the control lead aforesaid, said second circuit being capable of delivering at its output said control signal whose first value is obtained when the voltage applied to the input of the second circuit is lower than a threshold value and whose second value is obtained when the voltage applied to the input is higher than said threshold value,

wherein said first circuit comprises an amplifier A_3 whose input is connected through a switch having two inputs and one output either to the output of a first amplifier A_1, or the output of a second amplifier A_2, said switch being provided with a control lead which constitutes the control lead of said first circuit, said amplifier A_1 being provided with a negative input connected on the one hand to said capacitor through an input resistor R_e and on the other hand to the output of the amplifier A_3 through a resistor R_f being provided with a positive input connected to a reference point, said amplifier A_2 being provided with a negative input connected to the output of the amplifier A_3 and additionally to a reference point through a resistor R_g and a positive input connected to the negative input of the amplifier A_1.

4,093,877
SEMI-CONDUCTOR SWITCHING CIRCUIT WITH TRANSISTOR SWITCHING POWER LOSS REDUCTION MEANS

Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Division of Ser. No. 612,535, Sep. 11, 1978, Pat. No. 4,015,185.
This application Dec. 30, 1976, Ser. No. 755,637
Int. Cl.² H02M *3/155*
U.S. Cl. 307—270 **6 Claims**

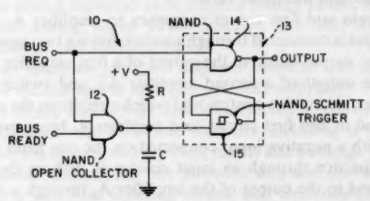


1. A semiconductor switching circuit comprising a direct current source; a semiconductor switch; and an inductor; said semiconductor switch and said inductor connected in series combination to said direct current source; means for deriving an output voltage from said inductor; a diode; a capacitor; an additional circuit including said diode and said capacitor connected in a first series combination; means connecting said series combination in parallel with said inductor; with said diode poled in the blocking direction as regards direct voltage applied to said inductor from said direct current source; a charging circuit coupled with said capacitor, said charging circuit including a further diode, with said further diode poled to pass current in response to direct voltage applied thereto from said source by way of said semiconductor switch; said charging circuit further including a choke coil, with said choke coil connected in series combination with said further diode and connected between said further diode and said capacitor; whereby the power loss occurring upon switching off said semiconductor switch is reduced.

4,093,878
DE-GLITCHABLENON-METASTABLE FLIP-FLOP CIRCUIT

James P. Paschal; Donald F. Nickel, and Charles J. Drozd, all of West Columbia, S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 29, 1976, Ser. No. 745,740
Int. Cl.² H03K *3/286*
U.S. Cl. 307—291 **10 Claims**



1. An de-glitchable non-metastable flip-flop circuit comprising:

a first gate having a first and a second input for receiving asynchronous input signals and for providing an output signal, the duration of said output signal being indicative of the degree of coincidence of said asynchronous input signals;

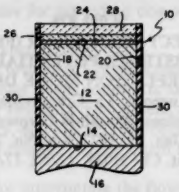
first means for providing a signal the level of which is a function of the duration of said output signal; and

second means, including threshold means activated upon sensing a particular level of signal from said first means, for receiving one of said asynchronous input signals and including means for providing a circuit output when activation of said threshold means coincides with the receipt of said one asynchronous input signal.

4,093,879
MAGNETOHYDRODYNAMIC ELECTRODE

David D. Marchant, Richland, Wash., and Don H. Killpatrick, Orland Park, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 1, 1977, Ser. No. 773,360
Int. Cl.² H02N *4/02*
U.S. Cl. 310—11 **11 Claims**



1. An electrode for use in a magnetohydrodynamic generator comprising:

a base portion of sintered powdered metal having a predetermined density, the base having a lower surface for attaching the electrode to a magnetohydrodynamic generator, two parallel side walls and an upper surface;

a first layer of nickel aluminide on the upper surface;

an intermediate layer of nickel aluminide and refractory ceramic on the first layer, the refractory ceramic being electrically conductive at MHD operating temperature; and

an outer layer of refractory ceramic on the intermediate layer, the refractory ceramic being electrically conductive at MHD operating temperatures.

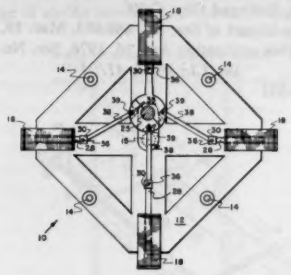
4,093,880
MAGNETICALLY OPERABLE ENGINE

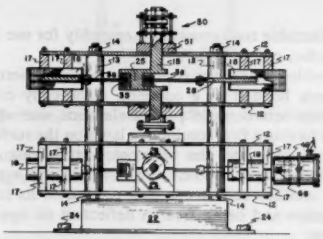
Benjiman R. Teal, 611 Marion St. NW., Madison, Fla. 32340

Filed Apr. 28, 1977, Ser. No. 791,957
Int. Cl.² H02K *41/00*
U.S. Cl. 310—24 **3 Claims**

1. An engine combination comprising a plurality of electromagnetic coil means for operating a like number of solenoids for converting electricity to mechanical power, a first separate bank of electro-magnetic coils and solenoids arranged about a single crank shaft and mounted upon a supporting plate to form a single power unit, and a base for supporting said first electric power unit and at least a second set of electro-magnetic coils and solenoids arranged about a second single crank shaft and mounted upon a second single plate to form a second single power unit positioned above said first power unit, and means for connecting one end of the crank shaft of the first power unit to one end of the crank shaft of the second power unit, a single timing mechanism arranged to connect all of the said electro-magnetic coils in proper sychronization with each of the said power units, each of the power unit supporting units

having means extending upwardly from the base for supporting the said plates supporting each of the power units, and





means for connecting the said coils in each bank with a source of electric energy.

4,093,881

ARRANGEMENT FOR SUPPORTING WINDING ELEMENTS IN THE STATOR SLOTS OF A DYNAMO-ELECTRIC MACHINE

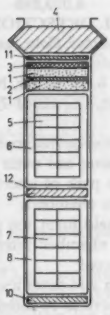
Gábor Lipták, and Roland Schuler, both of Wettingen, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 566,450, Apr. 9, 1975, abandoned. This application Aug. 17, 1976, Ser. No. 715,181

Claims priority, application Switzerland, Apr. 17, 1974, 5279/74

Int. Cl.[2] H02K *3/48*

U.S. Cl. 310—214 **5 Claims**



1. In an arrangement for supporting insulated conductor components within the slots of the stator component of a dynamo-electric machine under compression so as to inhibit vibration thereof, and wherein a resilient element is located in the slots along with the conductor components, and the conductor components and resilient element are placed under compression by means including slot key closing off the entrance to the slot, the improvement wherein said resilient element is constituted by a planar multi-layer structure possessing a spring characteristic which is degressive in relation to the spring force and which includes at least one layer of felt adjacent a layer or hard material, the ratio of the thickness of said felt layer to said hard layer being substantially 3:1, and wherein said felt layer includes an interior layer of a synthetic rubber, the ratio of the thickness of said felt layer to said synthetic rubber layer being in the range from 5:1 to 3:1.

4,093,882

CORELESS MOTOR

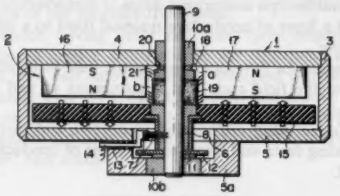
Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 14, 1975, Ser. No. 595,400

Claims priority, application Japan, Jul. 13, 1974, 49-83082[U]; Jul. 24, 1974, 49-88031[U]; Jul. 31, 1974, 49-91509[U]; Aug. 6, 1974, 49-93863[U]; Dec. 17, 1974, 49-153568[U]; Dec. 27, 1974, 50-266[U]; Dec. 27, 1974, 50-270[U]; Dec. 27, 1974, 50-271[U]; Apr. 17, 1975, 50-52577[U]; Jun. 6, 1975, 50-76638[U]; Jul. 19, 1974, 49-83014; Jul. 26, 1974, 49-85642

Int. Cl.[2] H02K *1/22*

U.S. Cl. 310—268 **9 Claims**



1. A coreless motor comprising:

a rotary shaft,

a rotor mounted on said rotary shaft and having a rotor substrate and a plurality of flat type loop coils disposed on the rotor substrate,

a motor housing including a magnetic yoke made of a magnetic material and having at least two spaced journal bearings for rotatably supporting said rotary shaft,

a stator including a pair of permanent magnetic poles opposed to said rotor within said housing so as to provide a closed magnetic flux path in which a magnetic flux emanated from one pole of said pair of permanent magnetic poles passes through said rotor and yoke and enters into the other pole, and

a generally cylindrical thrusting magnetic member attached to said rotor and being located in a space between said rotary shaft and said permanent magnetic poles, said magnetic member being displaceable axially of said rotor by a magnetic flux produced by said permanent magnetic poles of said stator so as to be thrusted toward either of said at least two journal bearings.

4,093,883

PIEZOELECTRIC MULTIMORPH SWITCHES

Yujiro Yamamoto, 2001 S. Eastwood, Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 589,255, Jun. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 390,473, Aug. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 246,310, Apr. 21, 1972, abandoned. This application Apr. 20, 1977, Ser. No. 789,185

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—317 **12 Claims**

1. In combination:

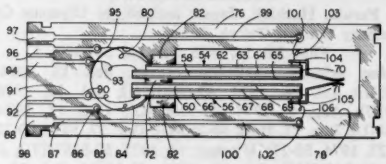
a frame;

a multimorph of piezoelectric material having a fixed part carried by said frame and a movable part free to flex in a plane of movement upon excitation of the multimorph;

a pair of electrical contacts, at least one of which is resiliently mounted, movable relative to one another in response to multimorph flexure;

means for applying an electrical potential to said multimorph in a magnitude sufficient to cause flexure of said multimorph whereby to actuate said contacts;

means for developing an electric field polarized such that it extends in a direction having a component parallel with the plane of movement of said multimorph and positioned



such that a part of said multimorph is subjected to said field whereby flexure of said multimorph as an incident to excitation will be altered by said field;

said multimorph comprising strips of piezoelectric material, and a layer of conductive material fixed to a side of said strips;

said means for developing an electric field being effective to form the field such that it terminates at said layers of conductive material; and

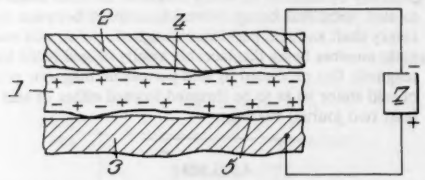
said frame being electrically conductive and said field extending from said frame to said layer of conductive material.

4,093,884

THIN STRUCTURES HAVING A PIEZOELECTRIC EFFECT, DEVICES EQUIPPED WITH SUCH STRUCTURES AND IN THEIR METHODS OF MANUFACTURE

Gerard Dreyfus, Villebon sur Yvette, and Jacques Lewiner, Saint Cloud, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, Seine, France

Continuation of Ser. No. 394,553, Sep. 6, 1973, abandoned. This application May 19, 1977, Ser. No. 798,355
Claims priority, application France, Sep. 8, 1972, 72.31903
Int. Cl.² H01L *41/10*
U.S. Cl. 310—328 **9 Claims**



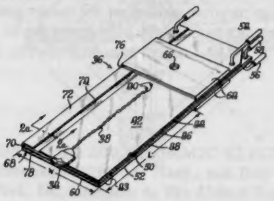
1. A thin structure comprising a dielectric leaf having trapped on or proximate at least one of the surfaces of said leaf electrostatic charges of opposite signs in balanced amounts and distribution such that the overall electrical field produced by said charges close to said surface is at least substantially nil, said leaf exhibits substantially no electrostatic effect, and said leaf exhibits a piezoelectric effect as a result of said charges which is independent of any polarization of said leaf.

4,093,885

TRANSDUCER ASSEMBLY VIBRATION SENSOR

David Edward Brown, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 668,653, Mar. 19, 1976, abandoned. This application Apr. 16, 1976, Ser. No. 677,683
Int. Cl.² H01L *41/04*
U.S. Cl. 310—331 **5 Claims**



1. A deflectable read transducer assembly for use in a magnetic recorder, comprising:

a deflectable support arm comprising a pair of piezo-ceramic elements bonded to a common electrically conductive substrate between said pair of elements, one of said elements having a first conductive layer on the surface opposite said substrate, the other element having a second conductive layer opposite said substrate, said support arm being cantilevered at one end portion of its lengthwise dimension and being free to deflect at its opposed end portion;

a read transducer mounted to one of said pairs of elements on the opposed free end portion of said support arm, said transducer being electrically isolated from said conductive layers so that voltage applied to said substrate and said first and second layers does not produce a signal that is read by said transducer; and,

a support arm deflection sensor comprising a piezo-ceramic generator element bonded to said common substrate and a third conductive layer overlying said generator element, said third conductive layer being generally in the same plane as said first layer and separated therefrom by a dielectric gap, said third conductive layer being electrically isolated from said first and second conductive layers, whereby deflection of said support arm results in an electrical output signal between said substrate and said third conductive layer, which output signal is indicative of the instantaneous amount of deflection of said support arm.

4,093,886

AEROSOL DETECTION DEVICE

Lyman L. Blackwell, Boulder, Colo., assignor to Statitrol Corporation, Lakewood, Colo.

Filed Jul. 6, 1976, Ser. No. 702,909
Int. Cl.² H01J *7/40*
U.S. Cl. 313—54 **32 Claims**

1. An aerosol detection device, comprising:

means for defining inner and outer ion chambers;

means for defining a path of interconnection between said inner and outer ion chambers;

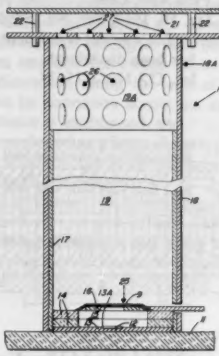
means for isolating said inner ion chamber except through said path of ion chamber interconnection from atmosphere outside thereof;

means for connecting said outer ion chamber in communication with atmosphere to be monitored;

particle source means positioned within said inner ion chamber for emitting and radiating charged particles into said inner ion chamber and through said path of ion chamber interconnection into said outer ion chamber;

a barrier of dielectric material formed across said path of ion chamber interconnection which is radiation permeable and aerosol impermeable, said dielectric barrier being permeable to and permitting the passage of said charged

particles being radiated into said outer ion chamber, said dielectric barrier being impermeable to and preventing the passage of smoke aerosols and the like whereby to isolate



the particle source of said device from contamination; and,

electrode means for generating and sensing ion current flow through said ion chambers.

4,093,887

SPARK PLUG, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES HAVING COMPOSITE CENTER ELECTRODE

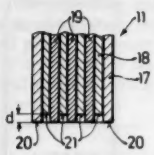
Rainer Corbach, Stuttgart; Leo Steinke, Waiblingen-Hegnach; Walter Benedikt, Stuttgart, and Rudolf Jurinke, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 4, 1976, Ser. No. 738,936

Claims priority, application Germany, Nov. 7, 1975, 2549931

Int. Cl.² H01T *13/20*

U.S. Cl. 313—140 **13 Claims**



1. Spark plug having a center electrode formed with a sparking end face comprising

an outer jacket (17, 17') of corrosion resistant material;

an embedding matrix material (18) of high electrical and thermal conductivity within the jacket (17, 17');

and at least one filamentary electrode element (19) of corrosion resistant material embedded in the matrix material (18),

wherein, in accordance with the invention,

the matrix material (18) is recessed with respect to the jacket (17, 17') at the sparking end face plane (20) of the spark plug, the distance of recess (*d*) being in the order of between about 50 to 500 μm.

4,093,888

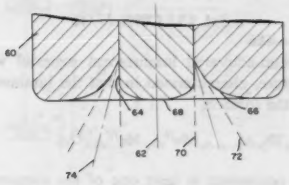
LIQUID-METAL PLASMA VALVE CONFIGURATIONS

Gisela Eckhardt, and Wilfried O. Eckhardt, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 2, 1976, Ser. No. 692,173

Int. Cl.² H01J *13/00*

U.S. Cl. 313—163 **22 Claims**



1. A liquid-metal plasma valve comprising:

an anode, a cathode and a condenser, an axis through said plasma valve, said anode facing said cathode to define an interelectrode space therebetween, said axis extending between said anode and said cathode through said interelectrode space, said condenser surrounding at least a portion of the interelectrode space;

said cathode having inner and outer pool-keeping walls defining a groove therebetween for containing a liquid-metal pool, said outer wall being divergent with respect to said inner wall in the direction out of said groove and the bisector between said walls being divergent away from said axis in the direction along said axis from said cathode toward said anode.

4,093,889

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

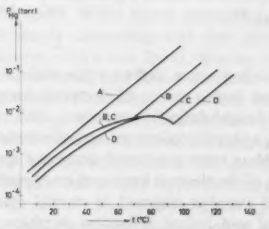
Jan Bloem, and Albert Bouwknegt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,097

Claims priority, application Netherlands, Apr. 3, 1976, 7602232

Int. Cl.² H01J *61/18*

U.S. Cl. 313—229 **4 Claims**



1. A low-pressure mercury vapour discharge lamp which comprises a discharge space and disposed in said space two thermally emitting electrodes and a mercury amalgam composed of mercury, bismuth, tin and lead.

4,093,890

TERBIUM-ACTIVATED LUMINESCENT GARNET MATERIAL AND MERCURY VAPOR DISCHARGE LAMP CONTAINING THE SAME

Johannes Gerardus Verriet, and Antonius Maria Josephus Hubertus Seuter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,009

Claims priority, application Netherlands, May 13, 1976, 7605094

Int. Cl.[2] C09K *11/46*

U.S. Cl. 313—486 8 Claims

1. A terbium-activated luminescent material with garnet crystal structure, characterized in that the luminescent material satisfies the formula

$$Ln_{3-x-p}Tb_pA_{5-x-2y}Me^{II}_{x+y}Me^{IV}_{x+y}O_{12},$$

wherein Ln represents at least one of the elements yttrium, gadolinium and lutecium, A is at least one of the elements aluminium and gallium, wherein upto 40 mole % of A is replaceable by scandium, Me^{II} is at least one of the elements magnesium, calcium, strontium and zinc, and Me^{IV} is at lea one of the elements silicon, germanium and zirconium and wherein

$0 \leqq x \leqq 2.8$
$0 \leqq y \leqq 2.0$
$0.4 \leqq x+y \leqq 2.8$
$0.02 \leqq p \leqq 1.50$
$x+p \leqq 3.0$

4,093,891

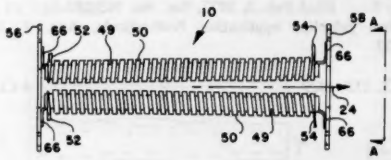
TRAVELING WAVE DEFLECTOR FOR ELECTRON BEAMS

Alvin Benson Christie, Dundee, and Ronald Eugene Correll, Lake Oswego, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 10, 1976, Ser. No. 749,579

Int. Cl.[2] H01J *23/16, 29/96*

U.S. Cl. 315—3 7 Claims



1. A traveling wave deflector for deflecting an electron beam emitted from a source of electrons, comprising:

a pair of helical deflection members, each of said members having a plurality of spaced and substantially flat conductive ribbon turns positioned along and spaced relative to an axis of the electron beam and on opposite sides thereof;

a ground member disposed in coaxial relationship inside each of said helical deflection members and being supported in spaced relationship thereto; and

means for insulatively supporting said ground member and said deflection members in said spaced relationship, said means disposed inside each of said helical deflection members.

4,093,892

RING-AND-BAR SLOW WAVE CIRCUITS EMPLOYING CERAMIC SUPPORTS AT THE BARS

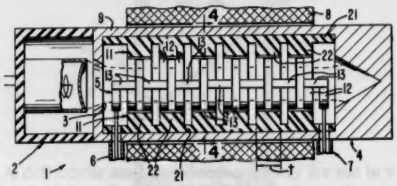
Norman R. Vanderplaats, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 16, 1967, Ser. No. 609,466

The portion of the term of this patent subsequent to Apr. 6, 1994, has been disclaimed.

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 6 Claims



1. In a microwave tube apparatus, means for forming a slow wave circuit having an array of spaced coaxially aligned conductive ring portions conductively connected together by an array of conductive bar portions, means for forming and projecting a beam of electrons axially through said ring portions for electronic interaction with the microwave fields of said slow wave circuit, means for forming a barrel structure surrounding said slow wave circuit, means forming an array of ceramic insulative support member portions interposed between said surrounding barrel structure and said slow wave circuit and spaced apart along the axis of said slow wave circuit, the improvement wherein, said support member portions are finger-shaped with the ends of said finger portions supportively contacting said connecting bar portions of said slow wave circuit, said support fingers are the finger portions of a ceramic comb-shaped structure having a spine portion and said finger portions.

4,093,893

SHORT ARC FLUORESCENT LAMP

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,761

Int. Cl.[2] H01J *17/34, 1/15, 17/20, 61/16*

U.S. Cl. 315—48 36 Claims

1. An improved short-arc fluorescent lamp of the type comprising two electrodes disposed in a gas and contained within and at opposite ends of a substantially tubular, light-transmissive evacuable envelope; wherein, as an improvement:

said gas comprises inert gases at a pressure between approximately 0.2 torr and approximately 2.0 torr; and

each of said electrodes comprises a heated filament coated with an electron emissive material and disposed within a substantially hollow cathode element which is adapted to provide a diffuse termination for an electric discharge, said cathode element having at least one aperture therein for electron emission therefrom, each of said electrodes having a dimension along the axis of the envelope no greater than its dimension across the envelope, whereby the arc distance is lengthened; and

said tubular envelope has a large diameter substantially half its length, whereby the envelope area is increased and phosphor loading is lessened.

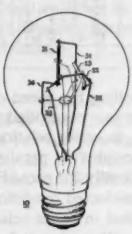
12. The lamp of claim 1 further comprising a lamp base assembly, attached to one end of said envelope, containing means for receiving electric power from a line source and means for supplying power to an electric discharge between said electrodes.

4,093,894

STAY-ON LAMP

Leroy G. Leighton, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,898
Int. Cl.[2] H01J *7/44, 13/46, 17/34;* **H01K** *1/62*
U.S. Cl. 315—64 **6 Claims**



1. A stay-on incandescent lamp comprising:

a primary filament;

a secondary filament which is less luminous than said primary filament;

switch means within said lamp for closing a circuit including said secondary filament in response to thermal radiation from said primary filament and maintaining said closed circuit for a predetermined time after thermal radiation from said primary filament ceases; and wherein

said lamp comprises three terminals, one of which is connected to both said primary filament and said circuit, a second of which is connected to the other end of said primary filament, and a third of which is connected to the other end of said circuit.

4,093,895

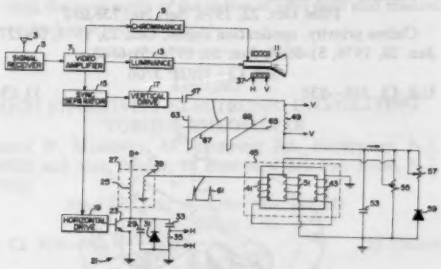
ASSYMETRIC TOP-BOTTOM PINCUSHION CORRECTION CIRCUIT

Robert P. Collette, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,640
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—371 **8 Claims**

1. In a cathode ray tube scanning system having a cathode ray tube with an associated deflection yoke which includes horizontal and vertical deflection windings coupled to a source of deflection current at horizontal and vertical scan frequencies and a top and bottom pincushion correction circuit having a saturable reactor with a control winding coupled to the source of deflection current at a horizontal scan frequency and an output winding coupled to a source of deflection current at a vertical scan frequency and to a shunt connected capacitor and impedance, the improvement comprising:

means coupled to said output winding for unbalancing the waveform applied thereto from said source of deflection



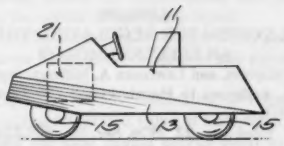
current at a vertical scan frequency to provide asymmetric top-bottom pincushion correction, said means of a form to provide a substantially constant crossover point of said waveform.

4,093,896

SPEED CONTROL FOR ROTATABLE ELEMENT DRIVEN BY DIRECT CURRENT MOTORS

Gerald N. McAuliffe, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 11, 1976, Ser. No. 713,399
Int. Cl.[2] H02P *5/46*
U.S. Cl. 318—45 **11 Claims**



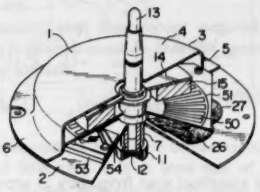
1. A drive control comprising a frame, an element rotatably supported by said frame, a first direct current motor on said frame, means drivingly connecting said first direct current motor to said element with a first speed reducing ratio, a second direct current motor on said frame, means drivingly connecting said second direct current motor to said element with a second speed reducing ratio lower than said first speed reducing ratio, a source of direct current, and a switch mounted on said frame and electrically connected to said source of direct current and to said first and second direct current motors and including means for initially electrically connecting said direct current source to said first direct current motor whereby to drive said element at a slow speed, and for subsequently additionally electrically connecting said source of direct current to said second direct current motor while maintaining electrical connection of said direct current source to said first direct current motor, whereby to drive said element at a fast speed.

4,093,897

ELECTRIC MOTOR

Masahiko Fujita; Toshihiko Gotoh, both of Yokohama, and Tsutomu Nakamura, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 22, 1976, Ser. No. 735,032
Claims priority, application Japan, Oct. 23, 1975, 50-127768; Jan. 26, 1976, 51-6666; Jan. 26, 1976, 51-6668
Int. Cl.[2] H02P 5/06
U.S. Cl. 218—138 11 Claims



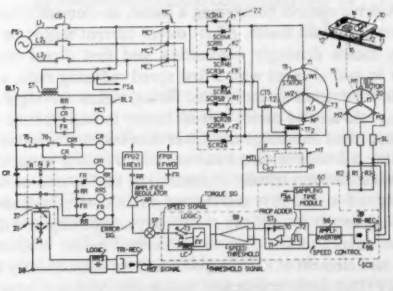
1. An electric motor comprising:
a rotary shaft,
a disk-shaped multi-pole magnet coupled to said rotary shaft and having a plurality of discrete magnet poles,
a pair of drive coils arranged within a magnetic field of said magnet and having drive sections which are linked by magnetic fluxes of said magnet,
means for supplying drive currents to said pair of drive coils to cause them to generate a drive magnetic field,
a speed detection coil arranged within the magnetic field of said magnet and the drive magnetic field of said pair of drive coils for generating a signal having a frequency corresponding to the rotational speed of said magnet,
a cancellation coil arranged within the magnetic field of said drive coil for generating a voltage having a frequency and an amplitude both of which vary with the change in the drive magnetic flux of said drive coils, and
means for adding the voltage generated at said cancellation coil to the signal generated at said speed detection coil to cancel a voltage generated at said speed detection coil due to the change in the drive magnetic flux of said drive coils.

4,093,898

CONTROL SYSTEM FOR REGULATING THE SPEED OF AN ELECTRIC MOTOR

Ronald W. Morters, and Lawrence A. Millonzi, both of Milwaukee, Wis., assignors to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Jun. 22, 1976, Ser. No. 698,320
Int. Cl.[2] H02P 1/26
U.S. Cl. 318—227 12 Claims



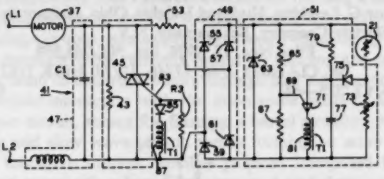
1. Means for ascertaining the instantaneous rotor speed of an alternating current induction motor having a wound rotor and a stator and energizable from a source of alternating current electric power through a controlled rectifier bank connected to said stator comprising:
first means, including a time-controlled sampling module switch, for detecting the instantaneous voltage in said wound rotor at a predetermined point in time and providing an alternating current signal related thereto;
second means for reducing, rectifying and inverting said alternating current signal and for providing a signal related thereto; and
third means for receiving and converting said signal into an analog voltage signal proportional to instantaneous speed.

4,093,899

CIRCUIT AND METHOD FOR CONTROLLING SPEED OF AN ALTERNATING CURRENT MOTOR

Dann W. Denny, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 548,764, Feb. 10, 1975, Pat. No. 4,007,605.
This application Aug. 18, 1976, Ser. No. 715,280
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—227 11 Claims



1. A circuit for controlling the speed of an alternating current motor comprising a gate controlled full wave alternating current switch coupled in series relation with the motor, a phase control circuit coupled in parallel relation with said switch and operable generally for providing signals indicative of the occurrence of preselected conditions, a dropping resistance respectively coupled in series relation with the motor and in parallel relation with said switch, said dropping resistance being by-passed when said switch is conducting in either direction and providing a motor operating current path when said switch is non-conducting, and means for transmitting the indicative signals to the gate of said switch to control the duration of the conduction thereof in either direction and thereby vary the energy delivered to the motor for controlling its speed in accordance with the occurrence of the preselected conditions.

4,093,900

DYNAMIC BRAKE BLENDING FOR AN INVERTER PROPULSION SYSTEM

Allan Barr Plunkett, Scotia, N.Y., assignor to General Electric Company, Erie, Pa.

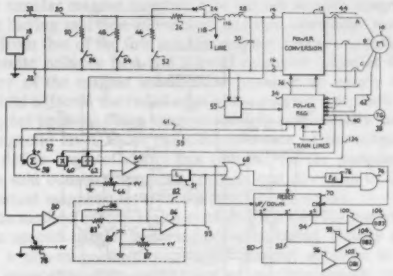
Filed Aug. 11, 1976, Ser. No. 713,491
Int. Cl.[2] H02P 3/22
U.S. Cl. 318—370 10 Claims

1. In a traction motor propulsion system of the type comprising an adjustable speed a-c motor, a d-c power source, an inverter having d-c terminals connected to said source and a-c terminals connected to said motor, and control circuitry connected to the inverter and responsive to a commanded torque signal and to motor feedback signals for varying a parameter of the alternating voltage at the a-c terminals of the inverter so as to regulate the torque output of the a-c motor, the control circuitry including means for preventing the magnitude of inverter d-c terminal voltage during electrical braking from exceeding a predetermined maximum limit, an improved electrical brake blending system comprising:
a. a plurality of braking resistors and a corresponding plurality of switches having conducting and non-conducting states, each of said resistors being serially connected to a

corresponding one of said switches to thereby form a plurality of braking stages;

b. means connecting each of said braking stages in parallel circuit arrangement with the d-c power source;

c. circuit means responsive to motor torque, motor rotational velocity and inverter terminal voltage and operative during electrical braking when motor torque is less



than commanded torque for producing an error signal representative of a change in motor current required to increase motor torque to said commanded torque; and

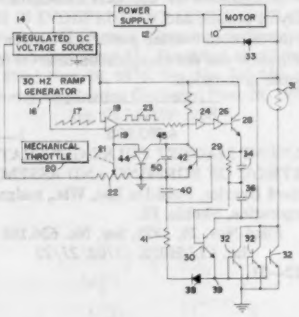
d. switch control means responsive to said error signal achieving a predetermined value for changing states of selected ones of said switches to alter the combination of braking stages conducting current so as to increase the motor generated current.

4,093,901

DC MOTOR SPEED CONTROL CIRCUIT

Ronald N. Rose, 2701 Terrace View La., Wayzata, Minn. 55391

Filed May 25, 1977, Ser. No. 800,530
Int. Cl.² H01H 7/08
U.S. Cl. 318—476 **9 Claims**



1. A DC power control circuit adapted to control power to a load such as a motor comprising in combination:

output means adapted to be connected to the load;

output switching means connected to said output means;

control switching means connected to said output switching means so as to control the output switching means;

pulse generating means;

manual control means;

pulse width modulating means connected to said pulse generating means and to said manual control means so as to vary the duty cycle of the pulses from the pulse generating means in accordance with the position of the manual control means;

control signal transfer means connected between said pulse width modulating means and said control switching means; and

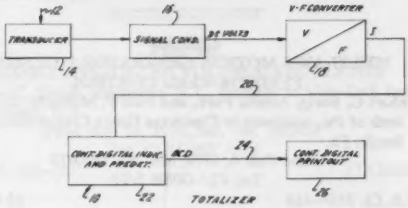
latching automatic shutdown means connected to said control switching means and to said pulse width modulating means so as to reduce the duty cycle of the pulses to zero in response to excessive current in the control switching means, said automatic means connected to latch on and hold the duty cycle of the pulses at zero until said manual control means is set at zero.

4,093,902

HIGH SENSITIVITY ELECTRONIC INTEGRATING TORQUE RHEOMETER

Leonard W. Mentovay, 16 Fairmount Rd., Parsippany, N.J. 08859, and Alex Palmer, 24 Westwood Dr., Fair Lawn, N.J. 07410

Filed Dec. 29, 1976, Ser. No. 755,359
Int. Cl.² G05B 1/08
U.S. Cl. 318—490 **15 Claims**



1. A mixing control system for elastomeric materials comprising:

a mixer housing forming a mixing chamber therein for receiving said elastomeric materials

at least one rotatable mixing means in the chamber;

a dynamometer coupled to and driving said rotatable mixing means;

torque sensing means for detecting torque exerted by the mixing means; said sensing means providing a torque signal level for controlling said mixing means;

voltage-to-frequency conversion means for processing said signal level and for converting said signal level into a pulse signal in which the pulse frequency varies in correspondence to the amplitude of the signal level;

pulse counting means for continuously and cumulatively counting the pulses of said pulse signal;

display means for displaying the count of said pulse counting means as the value of the integral of said signal level with respect to time; and,

control responsive means automatically responsive to a predetermined integrated value of said display means for controlling the total mixing energy input to the mixing control system.

4,093,903

APPARATUS FOR EXTENDING THE LINEAR SIGNAL RANGE OF A ROTARY TRANSFORMER TYPE DEVICE

Ronald E. Thomas, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,327
Int. Cl.² B64C 13/18
U.S. Cl. 318—584 **12 Claims**

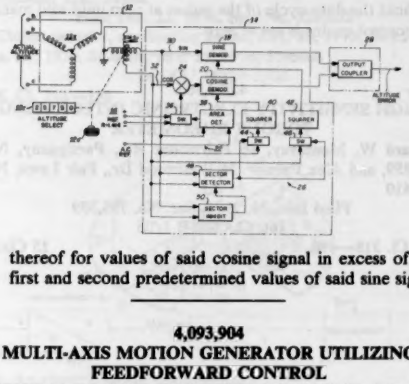
1. Apparatus for extending the linear range of a rotary transformer type device including polyphase stator windings and sine and cosine rotor windings comprising,

means responsive to the signal of said sine winding for providing a first output signal proportional thereto between first and second predetermined values thereof,

means for providing a predetermined constant reference signal,

means responsive to the signal of said cosine winding and

said constant reference signal for providing a resultant second output signal proportional to the combination



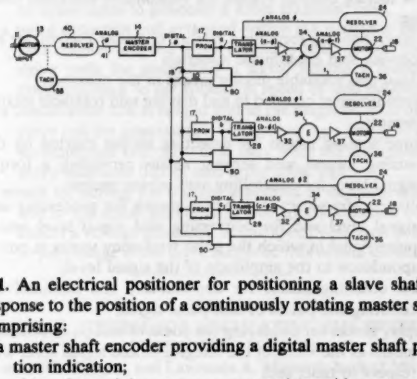
thereof for values of said cosine signal in excess of said first and second predetermined values of said sine signal.

4,093,904

MULTI-AXIS MOTION GENERATOR UTILIZING FEEDFORWARD CONTROL

Robert G. Burig, Allison Park, and Paul F. McNally, Gibsonia, both of Pa., assignors to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1976, Ser. No. 655,072
Int. Cl.[2] G05B 5/01
U.S. Cl. 318—616 **12 Claims**



1. An electrical positioner for positioning a slave shaft in response to the position of a continuously rotating master shaft comprising:

a master shaft encoder providing a digital master shaft position indication;

position determining means connected to said master shaft encoder and providing a digital slave shaft position in response to the digital master shaft position;

a first digital storage connected to and storing the digital output of the associated position determining means;

a second digital storage device;

a shifting means for shifting the digital signal stored in said first storage device to said second storage device when said master axis position changes by one digital increment;

a pair of digital-to-analog converters connected to said first storage device and said second storage device for converting the digital outputs to analog outputs;

multiplying means for multiplying the outputs of said digital-to-analog converters by the signal related to the velocity of the master axis;

subtractor means for subtracting the analog signals out of said digital-to-analog converters providing a velocity feedforward signal;

the velocity feedforward signal is calculated for each incremental change in the digital master shaft position; and,

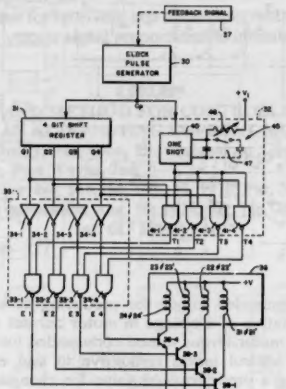
positioning means connected for positioning the slave shaft to the digital slave shaft position from said position determining means as function of the velocity feedforward signal.

4,093,905

STEPPING MOTOR USING EXTENDED DRIVE PULSES

Leopold von Braun, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jun. 1, 1976, Ser. No. 691,678
Int. Cl.[2] H02K 37/00
U.S. Cl. 318—696 **14 Claims**



1. A method for operating a stepping motor having a plurality of individually energizable phases comprising the steps of:

sequentially energizing each of a plurality of phases for distinctive intervals of time;

the energization interval of each one of the phases overlapping in time with the energization interval of the phase first subsequent thereto for a selected overlap period, the selected overlap period being such that the energization interval of the one phase terminates a selected time prior to the energization of the next subsequent one of the plurality of phases; and

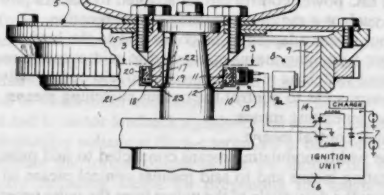
wherein the selected overlap period for a given phase is of a fixed duration and the energization interval for that phase is variable in duration.

4,093,906

PERMANENT MAGNET PULSE GENERATOR AND METHOD OF FORMING AND ASSEMBLY

James Richard Draxler, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 28, 1975, Ser. No. 636,105
Int. Cl.[2] H02K 15/02, 21/22
U.S. Cl. 322—51 **15 Claims**



1. A trigger pulse generator for coupling to a driven shaft for establishing time spaced ignition control signal pulses separated by essentially zero output levels comprising an annular permanent magnet unit defining the only source of magnetic force in the pulse generator, said unit having a first annular

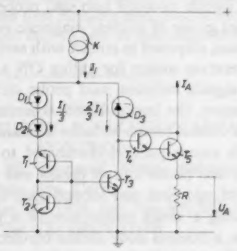
magnet member radially magnetized, said magnet member having first and second circumferentially spaced and circumferentially extended portions, said portions being reversely magnetized whereby the first portion defines a North pole at the outer periphery of the magnet member and a South pole in radial alignment with the North pole, said magnet unit having a second annular magnet member in axially spaced adjacent relation to said first annular magnet member with first and second portions aligned with the first and second portions of the first annular magnet member, said second annular magnet member having said first and second portions oppositely magnetized from that of the first annular magnet member to define the opposite polarity first and second magnetic poles at the periphery of the magnet members to generate an axially directed field adjacent the radial edge of the magnet unit, each of said magnet portions being magnetized to a substantially constant magnetic level about the circumference of the magnet unit to define areas of sharp flux reversal on the periphery between said constant magnetic level in one direction to the said constant magnetic level in the opposite direction.

12. The method of forming an annular rotor unit for generating time spaced trigger pulse signals comprising, fixedly attaching a non-magnetized permanent magnet member to a tubular supporting hub, assembling an electromagnetic coil assembly in fixed relation about the periphery of said magnet member, energizng said assembly with a direct current to establish a unidirectional magnetic field about a selected elongated portion of the magnet member with said magnetic field passing radially from said coil assembly through one axial end portion of said magnet member and axially through the hub and returning radially through the opposite axial end portion of said magnet member to the coil assembly and thereby forming a magnetized magnet member, said magnetic field being selected to saturate said magnet member to form permanent magnets of opposite polarization at the opposite axial ends of the annular magnet member, the magnets in said magnet member being magnetized to a constant level about the selected elongated portion, and disassembling of said magnetized magnet member from said electromagnetic coil assembly.

4,093,907
REFERENCE SOURCE FOR PRODUCING A CURRENT WHICH IS INDEPENDENT OF TEMPERATURE

Karl-Diether Nutz, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Nov. 18, 1976, Ser. No. 743,143
Claims priority, application Germany, Nov. 28, 1975, 2553431
Int. Cl.² G05F 1/58
U.S. Cl. 323—1 **7 Claims**



1. A reference source for producing an output current independent of temperature comprising:

a constant current source;

first and second Zener diodes of different Zener voltage;

two parallel-connected current branches supplied by said current source with each said branch including one of said Zener diodes and at least one of said branches including a plurality of series connected diodes driven in the forward direction;

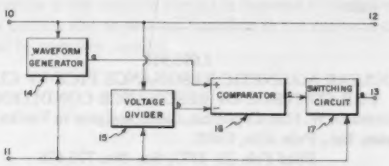
a current mirror circuit having components in each of said current branches and including a first transistor, whose emitter-collector path is connected in one of said current branches, for producing an output voltage across its collector-emitter path substantiallly determined by the difference in the Zener voltages of said first and second Zener diodes; and

a transistor Darlington circuit to which the output voltage of said first transistor is fed, said Darlington circuit including second and third transistors, with said second transistor having its base connected to the collector of said first transistor, and a resistor, which determines the magnitude of the output current of said reference source, connected in the emitter path of said third transistor; and wherein said transistors of said Darlington circuit and said diodes driven in the forward direction are selected so as to render said output current of said reference source independent of temperature when there is a distribution of currents over said two current branches as forced by said current mirror circuit.

4,093,908
PHASE-CONTROLLED VOLTAGE REGULATOR

William C. Evans, Rochester, N.Y., assignor to Viva-Tech Inc., Rochester, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,632
Int. Cl.² G05F 3/04
U.S. Cl. 323—19 **17 Claims**



16. A method for maintaining at a substantially constant value the RMS voltage applied to a load from an AC power source of sinusoidal waveform, such power source having an RMS value which varies within a predetermined range of values, said method comprising the steps of:

(a) generating a predetermined bipolarity waveform having a period corresponding to the period of said sinusoidal waveform;

(b) comparing said bipolarity waveform with the sinusoidal waveform characteristic of the instantaneous RMS voltage of the source to produce a signal each time the instantaneous algebraic difference of said waveforms first changes sign after the start of each cycle of said sinusoidal waveform; and

(c) utilizing said signal to trigger a phase-controlling switch which controls the RMS voltage applied to the load by interrupting the power applied to the load at the start of each cycle of said power source until said signal is received by said switch.

4,093,909
METHOD AND APPARATUS FOR OPERATING A SEMICONDUCTOR INTEGRATED CIRCUIT AT MINIMUM POWER REQUIREMENTS

Donald L. Watrous, and Daniel W. Dobberphul, both of Liverpool, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1976, Ser. No. 707,278
Int. Cl.² G05F 1/56
U.S. Cl. 323—22 R **10 Claims**

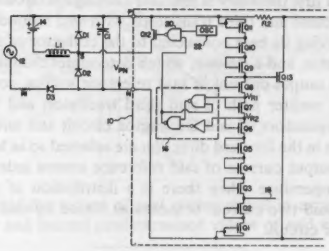
6. In combination a semiconductor integrated circuit adapted to be powered from a battery and a converter having

a charge storage capacitor for providing a filtered DC voltage to said circuit, the improvement comprising:

voltage divider means in said integrated circuit for providing a semiconductor integrated circuit process parameter dependent reference voltage;

comparator means for comparing the magnitudes of said reference voltage and said filtered DC voltage, said comparator means providing an output control signal indicative of the relative magnitudes of said voltages; and

switching means operatively connected to said output control signal for enabling said converter to charge said capacitor and maintain the magnitude of said DC voltage at the minimum value required for reliable circuit operation with minimum power consumption in the integrated circuit.

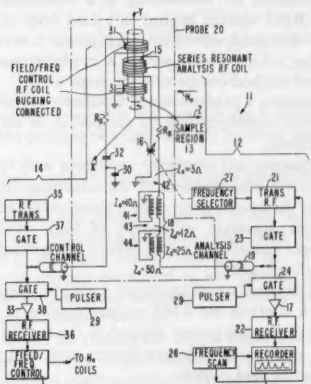


4,093,910

NUCLEAR MAGNETIC RESONANCE PICK-UP CIRCUIT FOR CONTROL OF RESONANCE CONDITIONS

Howard D. W. Hill, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 22, 1977, Ser. No. 770,478
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—0.5 AH **2 Claims**



1. In a nuclear magnetic resonance spectrometer of the type having an analysis channel and a control channel coupled in radio frequency magnetic field exchanging relation via separate analyzing and control radio frequency coil means to a common region for containing both an analysis group of nuclear magnetic resonators and a control group of nuclear magnetic resonators for controlling the resonance conditions of both groups, the improvement wherein:

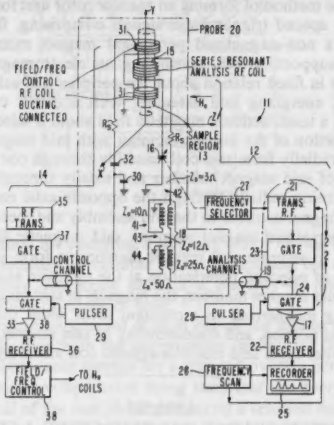
said control radio frequency coil means is formed and arranged relative to said analysis radio frequency coil means so that one of said coil means includes first and second spaced portions wound on a common axis for flow of the radio frequency current therethrough such that the RF magnetic field region produced by said spaced portions of said one coil means are in opposite directions within the region bounded by said other coil means.

4,093,911

NUCLEAR MAGNETIC RESONANCE SPECTROMETER EMPLOYING AN IMPROVED RESONANCE SIGNAL GATING CIRCUIT

Howard D. W. Hill, Cupertino, and John R. Laudermilch, Foster City, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 22, 1977, Ser. No. 770,479
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 AH **3 Claims**



1. In a nuclear magnetic resonance spectrometer of the type having a probe circuit means disposed in radio frequency magnetic field exchanging relation with a sample region for containing a group of nuclear magnetic resonators for exciting and detecting resonance of the group of nuclear magnetic resonators, receiver means for receiving and amplifying the resonance signals coupled into said probe circuit means from the resonant group of nuclear magnetic resonators, and a gate circuit means, disposed in circuit with said probe circuit means and said receiver means for gating ON and OFF the flow of electrical signals between said probe circuit means and said receiver means, the improvement wherein:

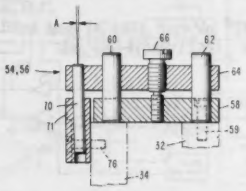
said gate circuit means includes first and second gate circuit branch means parallel connected to each other and between said probe circuit means and said receiver means, each of said first and second gate circuit branch means including a series connection of a pair of gating diode means, a control node means connected in between each pair of gating diode means for application of a control potential to respective ones of said diode means for biasing said diode means between conductive and nonconductive modes of operation for gating ON and OFF the flow of signals between said probe circuit means and said receiver means; and

said diode means of said first and second parallel branches being oppositely poled relative to their respective control node means such that transient feedthrough of biasing pulse signals of equal magnetic and opposite sign cancel each other on the signal line gated ON and OFF by said gate means.

4,093,912
NMR MAGNET ASSEMBLY WITH POLE FACE PARALLELISM ADJUSTMENT

Glen P. Double; Vincent N. Kahwaty, both of Poughkeepsie; James D. Randall, Pleasant Valley, and Fritz M. Reinhart, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,798
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 MA 12 Claims



1. In an NMR magnet assembly having a permanent magnet including two spaced cylindrical magnetic cores and a cylindrical hollow flux-return-path casing surrounding said cores, the combination therewith of a pole piece sub-assembly enclosed in said casing and comprising:

two pole pieces supported between said cores and spaced therefrom and from each other, said pole pieces having flat parallel pole faces spaced to provide a gap having a homogeneous magnetic field;

a fixed support connected to said casing and supporting one of said pole pieces in a fixed position relative to said cores;

a pivotable support pivotably connected to said fixed support and supporting the other one of said pole pieces whereby said pole face thereof is pivotable about a pivot with two degrees of freedom of movement; and

two adjustment mechanisms connected between said supports for positioning of said pivotable pole face in accordance with said two degrees of freedom of movement respectively;

each of said adjustment mechanisms comprising a first member movable radially of said pivotable pole face, a differential screw connected between said first member and one of said supports and operative to move said first member radially in response to rotation of said screw, and a second member extending radially between said first member and the other one of said supports, said second member having a slight longitudinal angle of incline for translating radial movement of said first member into pivotal movement of said movable pole face in one of said degrees of freedom of movement.

4,093,913
VACUUM MEASURING IONIZATION APPARATUS CONTROL

Charles D. O'Neal, III, Pepperell, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 24, 1976, Ser. No. 670,512
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—33 9 Claims

1. A controller for a pressure measuring device having a hot cathode, an anode and an ion collector, said controller comprising:

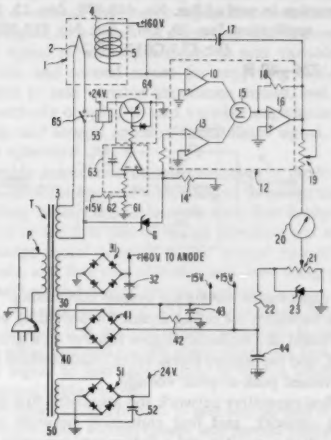
first means for providing an output signal representative of the ion current through the collector;

second means for providing an output signal representative of the electron emission current from the cathode;

means for combining the outputs of said first and second means to provide a representation of a ratio of said outputs;

indicator means responsive to said ratio to give an indication of pressure in the pressure measuring device;

circuit means to energize the cathode to generate emission current, said emission current being responsive to the temperature variation of the cathode with variation of pressure in the device; and

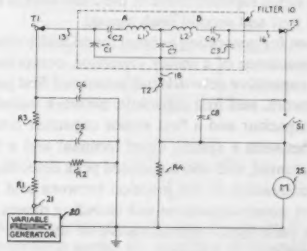


said energizing circuit means being constructed to prevent variation in the emission current in response to variation in ion current and to prevent variation in the emission current by operator control.

4,093,914
METHOD OF MEASURING PARAMETERS OF A CRYSTAL FILTER

Harry J. Peppiatt, and Gerald E. Roberts, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Apr. 6, 1977, Ser. No. 784,970
Int. Cl.[2] G01R *29/22, 27/26*
U.S. Cl. 324—56 9 Claims



7. A method of measuring selected parameters of a crystal filter having a piezoelectric plate, an input electrode on said plate, a common electrode on said plate, and an output electrode on said plate, said method comprising the steps of:

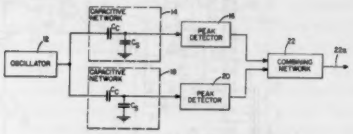
a. applying a band of frequencies to said input electrode relative to a reference point while said output electrode and said common electrode are connected by a short circuit; and

b. determining the frequencies which cause the voltage at said common electrode relative to said reference point to be a maximum and a minimum.

4,093,915
CAPACITANCE MEASURING SYSTEM

Dennis K. Briefer, Berlin, Mass., assignor to Setra Systems, Inc., Natick, Mass.

Continuation-in-part of Ser. No. 648,490, Jan. 12, 1976. This application Jun. 29, 1977, Ser. No. 811,385
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—60 R 23 Claims



1. A capacitance measuring system comprising:

A. an oscillator including means for providing at an output terminal an oscillatory signal relative to a ground potential, said oscillatory signal being characterized by a predetermined peak-to-peak voltage,

B. a first capacitive network and associated first peak detecting network, said first capacitive network including a coupling capacitor and a first sensor capacitor connected in series between said output terminal and said ground potential, said first sensor capacitor having one terminal connected to said ground potential, and said first peak detecting network being connected to the junction between said coupling and first sensor capacitors and including means to generate a first peak signal representative of the peak-to-peak voltage at said junction,

C. A second capacitive network and associated second peak detecting network, said second capacitive network including a coupling capacitor and a second sensor capacitor connected in series between said output terminal and said ground potential, said second sensor capacitor having one terminal connected to said ground potential, and said second peak detecting network being connected to the junction between said coupling and second sensor capacitors and including means to generate a second peak signal signal representative of the peak-to-peak voltage at said junction,

D. combining means coupled to an output terminal of said first and second peak detecting networks for producing an output signal representative of the difference in magnitude of said first and second peak signals.

9. A system for generating a signal functionally related to the capacitive reactance of a sensor capacitor, comprising:

A. a first capacitive network and associated first peak detecting network, said first capacitive network including a first drive capacitor and a first sensor capacitor connected in series between a system input terminal and a first reference potential, and said associated peak detecting network being connected to the junction between said first drive and first sensor capacitors and including means for generating a peak signal representative of the peak voltage at said junction,

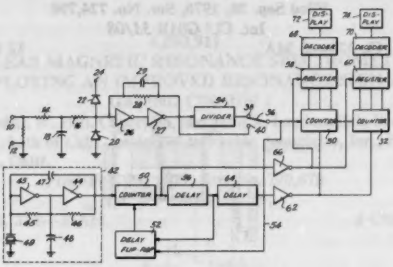
B. an oscillator coupled to said system input terminal and having a control terminal, said oscillator including means to generate an oscillatory signal at said system input terminal, said oscillatory signal being characterized by an amplitude proportional to the voltage at said control terminal, and

C. feedback network coupled between said first peak detecting network and said control terminal, said feedback network including means responsive to said peak signal and a second reference potential to apply a feedback signal to said control terminal whereby the peak amplitude of the voltage across said drive capacitor is constant.

4,093,916
DIGITAL TACHOMETER

Steven E. Summer, 37 View Rd., Setauket, N.Y. 11785

Filed Oct. 4, 1976, Ser. No. 729,212
Int. Cl.[2] G01P 3/48
U.S. Cl. 324—166 2 Claims

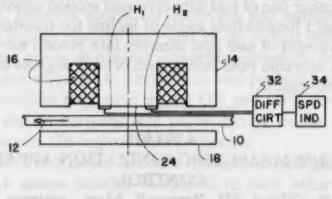


1. A speed measuring arrangement comprising, in combination, a source of pulses occurring at a frequency corresponding to a speed to be measured; counting means connected to said source for counting said pulses; means for generating a predetermined time interval connected to said counting means for actuating said counting means so that said pulses are counted only within said time interval; and means connected between said source of pulses and said time interval generating means for starting said time interval only at a predetermined and constant instant of one of said pulses; the number of pulses counted within said time interval being constant for any predetermined magnitude of the speed being measured, said speed being variable over time.

4,093,917
VELOCITY MEASUREMENT SYSTEM

Walter Haeussermann, Huntsville, Ala., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 6, 1976, Ser. No. 730,046
Int. Cl.[2] G01P 3/48
U.S. Cl. 324—173 6 Claims



1. A velocity sensor for measuring the surface speed of a conductive body along a path of movement comprising:

an E-shaped magnetic core having a central pole and two spaced outer poles, the ends of said poles being configured to be closely spaced from the conductive surface of a moving body the speed of which is to be measured, said poles being positioned, in line, along said path of movement of said body;

an energizing coil coupled to said central pole;

first and second Hall effect devices positioned in a spaced relation along said path of movement of said body on the end surface of said central pole of said core, and each said Hall effect device having a bias input and signal output;

bias means for applying a biasing current to said energizing coil and to the bias input of said Hall effect devices; and

difference means connected to the signal outputs of said Hall

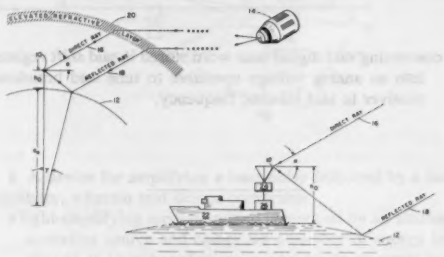
effect devices for subtracting the signal outputs and providing a signal indicative of the velocity of a conductive body moving across but spaced from the end surfaces of said poles and said Hall effect devices.

4,093,918

MEANS FOR DETERMINING THE REFRACTIVE INDEX PROFILE OF THE ATMOSPHERE

Herbert V. Hitney, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,868
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—67 **6 Claims**



1. A method for determining the refractive index profile of the lower atmosphere comprising the steps of:

(a) observing the signal pattern of a signal received from a satellite transmitter as the satellite moves through low elevation angles over a selected period of time;

(b) calculating a number of hypothetical signal patterns;

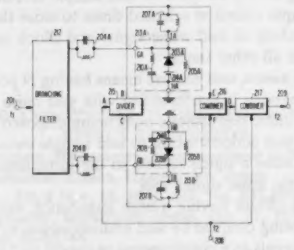
(c) comparing each of said hypothetical signal patterns with said observed signal pattern until one of said hypothetical signal patterns matches said observed signal pattern to within a selected limit of error, each of said hypothetical signal patterns is calculated by hypothesizing a different refractive index profile, the hypothesized refractive index profile of said matching hypothetical signal pattern comprising the refractive index profile to be determined.

4,093,919

CARRIER CONVERTER COMPRISING A VARIABLE IMPEDANCE CIRCUIT PAIR OR AT LEAST ONE BALANCED DIODE BRIDGE

Hiroshi Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,921
Claims priority, application Japan, Aug. 14, 1975, 50-98853; Aug. 14, 1975, 50-98854; Aug. 14, 1975, 50-98855; Aug. 14, 1975, 50-98856; Jan. 19, 1976, 51-5269
Int. Cl.[2] H03C *1/50*
U.S. Cl. 325—316 **14 Claims**



14. In a carrier converter for converting a first amplitude modulated signal derived by modulating a first carrier signal by a modulating signal to a second amplitude modulated signal derived by modulating a second carrier signal substantially by said modulating signal, comprising a variable impedance circuit having a variable impedance dependent on the amplitude of an input signal, first means for supplying said first amplitude modulated signal as said input signal to said variable impedance circuit, and second means for supplying said second carrier signal to said variable impedance circuit, and a third means operatively coupled to said variable impedance circuit for deriving said second amplitude modulated signal, the improvement wherein:

said variable impedance circuit comprises a diode bridge circuit having a first and a second pair of bridge terminals and being balanced with respect to a first bridge signal supplied to the first pair of bridge terminals and to a second bridge signal supplied to the second pair of bridge terminals, said first pair of bridge terminals being isolated from said second pair of bridge terminals;

said first meamns supplying said first amplitude modulated signal to said first pair of bridge terminals as said first bridge signal and said second means supplying said second carrier signal to said second pair of bridge terminals as said second bridge signal;

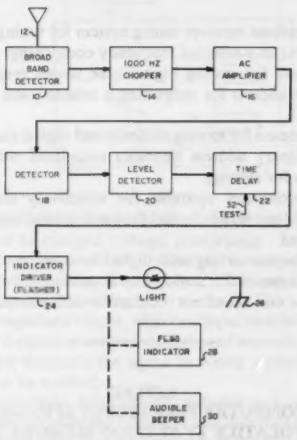
said third means being coupled to said second pair of bridge terminals via said second means, said second carrier signal being applied to said third means.

4,093,920

DELAYED RESPONSE TRANSMITTER INDICATOR

Martin L. Kaiser, 115 Bosley Ave., Cockeysville, Md. 21030

Filed Jun. 29, 1976, Ser. No. 700,919
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—364 **2 Claims**



1. A system for detecting the presence of radio frequency energy comprising: means for detecting modulated RF energy from a downed aircraft emergency locator transmitter including;

a. a broad band detector including an LRC peaked crystal detector tuned to 121.5 MHz and secondarily resonant at 243 MHz to receive a modulated RF input;

b. a chopper amplifier fed by said crystal detector including a 1000 Hz chopper and a high gain AC amplifier to produce an AC signal proportional to the RF input; a detector connected to said AC amplifier, said detector being adapted to produce a DC signal proportional in amplitude to the RF input;

c. a level detector fed by said AC amplifier and detector;

d. a time delay fed by said level detector, whereby the ab-

sence of a DC signal from the detector causes the level detector to activate the time delay to zero time and when an RF input occurs the level detector triggers the time delay and the timing process begins;

e. an indicator driver fed by said time delay; and

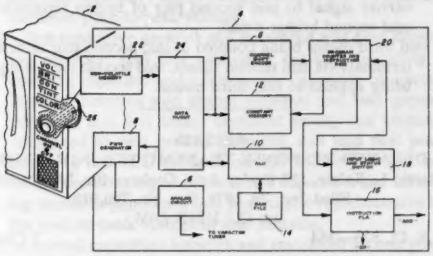
f. indicator means for detecting the output of said indicator driver, said output representing the presence of an RF input.

4,093,921

MICROCOMPUTER PROCESSING APPROACH FOR A NON-VOLATILE TV STATION MEMORY TUNING SYSTEM

Kenneth George Buss, Dallas County, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 17, 1977, Ser. No. 778,401
Int. Cl.² H04B *1/26*
U.S. Cl. 325—459 **23 Claims**



1. A broadcast receiver tuning system for tuning said broadcast receiver to a selected frequency comprising:

first means for storing digital tune words responsive to a binary address for outputting a selected said digital tune word,

second means for storing said selected digital tune word and said binary address operably associated with said first means for storing,

a microcomputer operable for selectively changing said digital tune words in said first and second means for storing, and

means for converting said digital tune word stored in said second means for storing into an analog voltage operative to tune said broadcast receiver to said selected frequency.

4,093,922

MICROCOMPUTER PROCESSING APPROACH FOR A NON-VOLATILE TV STATION MEMORY TUNING SYSTEM

Kenneth George Buss, Dallas County, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

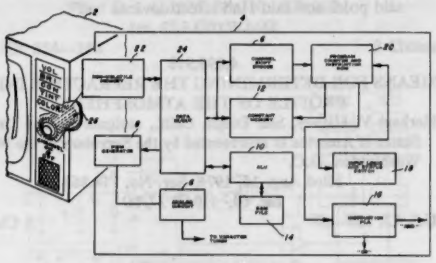
Filed Mar. 17, 1977, Ser. No. 778,400
Int. Cl.² H04B *1/26*
U.S. Cl. 325—459 **17 Claims**

1. A method for tuning a broadcast receiver to a selected frequency using a microcomputer comprising the steps of:

generating a binary address for outputting a digital tune word corresponding to said selected frequency from a memory matrix containing a plurality of said digital tune words;

storing said outputted digital tune word and said binary address in a shift register;

updating said digital tune word stored in said shift register by incrementing or decrementing said digital tune word by an increment value read from a data memory matrix; and



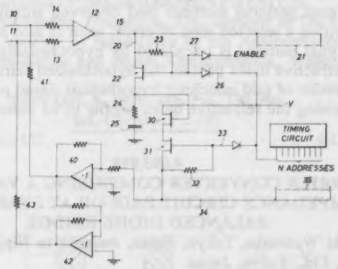
converting said digital tune word stored in said shift register into an analog voltage operative to tune said broadcast receiver to said selected frequency.

4,093,923

SIGNAL CANCELLING CIRCUIT

Karl McCormick, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1976, Ser. No. 753,658
Int. Cl.² G11C *27/02*; H04B *15/04*
U.S. Cl. 328—165 **12 Claims**



1. A passive system for cancelling a noise signal while preserving a desired signal having the same frequency, said system comprising:

a sample circuit, said sample circuit being disposed to sample said noise signal;

an enabling circuit coupled to said sample circuit to enable said sample circuit at selected times to store the instantaneous values of said noise signal and block said sample circuit at all other times.

an address means, said address means having N positions and being operable in synchronism with said noise signal;

N storage units, said storage units being disposed to be coupled by said address means to said sample circuit, to sample and store a signal related to the instantaneous amplitude of the noise signal; and

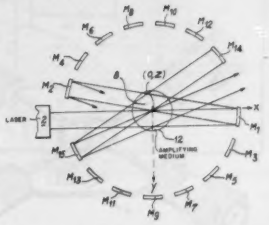
a feedback circuit having a high impedance, said feedback circuit being coupled by said address means to supply the stored signals to a circuit means to cancel said noise signal during time periods when said sample circuit is blocked by said enabling circuit.

4,093,924

DEVICE FOR APPLYING A LASER PULSE DELIVERED BY A LASER OSCILLATOR

Jean-Claude Farcy, Brüis-sous-Forges, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 22, 1975, Ser. No. 642,933
Claims priority, application France, Dec. 23, 1974, 74 42592
Int. Cl.[2] H01S *3/081, 3/091*
U.S. Cl. 330—4.3 6 Claims



1. A device for amplifying a laser pulse delivered by a laser oscillator, wherein said device comprises:

a light-amplifying medium which is pumped by an auxiliary excitation source and comprises a number of energy levels, one or a number of upper reserve levels, an upper laser level, a lower laser level and one or a number of lower reserve levels, the laser transition being intended to correspond to the laser pulse delivered by the oscillator and to take place between the upper laser level and the lower laser level,

a series of mirrors placed around the amplifying medium to reflect said laser pulse from one mirror to the following mirror of the series of mirrors, wherein the mirrors are so arranged as to ensure that the time interval Δt_1 which elapses between two successive passes of the pulse within the same volume of the amplifying medium is longer than the time interval Δt_2 which is necessary for population transfer between on the one hand the upper reserve level or levels and the upper laser level and on the other hand the lower laser level and the lower reserve level or levels, with the result that the amplifying medium is regenerated by population exchange at the lower and upper levels between each traversal of the pulse through said amplifying medium,

wherein the amplifying medium is placed between two parallel planes which are perpendicular to an axis Oz and wherein said mirrors are oriented so as to ensure that the path of the light pulse between said mirrors is perpendicular to said axis Oz.

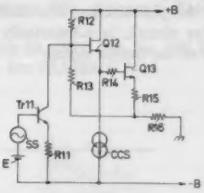
4,093,925

METHOD AND SYSTEM OF DRIVING POWER FIELD EFFECT TRANSISTOR

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 18, 1975, Ser. No. 632,899
Claims priority, application Japan, Jan. 27, 1975, 50-11076; Jul. 8, 1975, 50-83744
Int. Cl.[2] H03F *3/16, 3/21*
U.S. Cl. 330—277 9 Claims

1. A method of driving a triode-like junction field effect transistor for increasing its maximum power output: comprising the step of over-driving said transistor by applying thereto



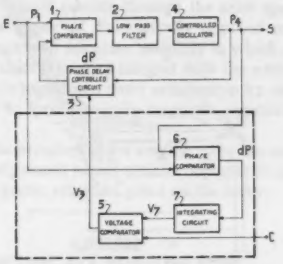
a forward gate-to-source voltage which is greater in the forward biasing direction than zero volts.

4,093,926

SYSTEM FOR ADVANCING AN ELECTRICAL SIGNAL IN PHASE UNDER THE CONTROL OF AN EXTERNAL VOLTAGE MORE ESPECIALLY FOR AN ENGINE OF A MOTOR VEHICLE

Jean Luc Lamarche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,324
Claims priority, application France, Feb. 27, 1976, 76 05587
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—11 1 Claim



1. A system for advancing in phase an electrical signal under the control of an external voltage, comprising:

a control oscillator circuit, delivering an output signal of which the frequency is controlled in dependence upon a frequency control voltage;

a phase comparison circuit, with two input terminals delivering said frequency control voltage, and receiving at one of said input terminals the signal to which a phase advance lead is to be applied;

a controlled phase delay circuit included in a return loop connected between the output of said controlled oscillator and the other of said input terminals of the phase comparison circuit, said frequency control voltage thus being dependent upon the phase comparison between the input signal and the delayed signal, by which the output signal of the controlled oscillator circuit is advanced in phase relative to the input signal, by an amount which is dependent upon the value of a phase control voltage, said phase control voltage being provided by said external voltage through a correcting circuit, wherein said correcting circuit is formed by:

a second phase comparison circuit which delivers a correcting voltage in dependence upon the phase comparison between the input signal to be phase-shifted and the output signal of the controlled oscillator circuit;

a voltage comparator-amplifier circuit which respectively receives at its inputs said correcting voltage and the external control voltage, said circuit thus delivering a voltage

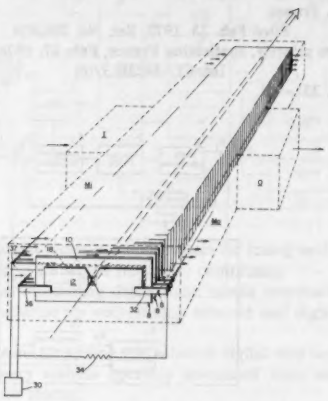
which is dependent upon the difference between the two voltages received, and which constitutes said phase-control voltage applied to said phase-delay controlled circuit, by which the phase delay, introduced by the controlled phase delay circuit, is substantially independent of the frequency of the output signal.

4,093,927

PULSED GAS LASER

Jeffrey Steven Levine, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 21, 1976, Ser. No. 650,912
Int. Cl.[2] H01S *3/096*
U.S. Cl. 331—94.5 PE 14 Claims



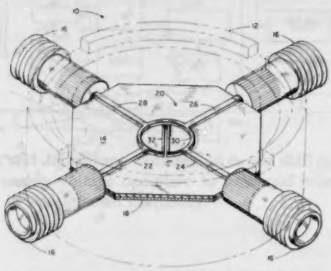
1. In a pulsed gas laser of the transmission line type having first and second co-extending sheetform conductors separated throughout their mutual extent by dielectric, said sheet form conductors having broad oppositely directed faces and relatively thin edges, the first of said conductors having an interruption defining a discharge gap, a lasing gas in said gap, a charging means for applying opposite voltages to the respective conductors, and a discharge means for causing current flow between the conductors, thereby to produce a voltage drop and discharge across said gap for energizing said lasing gas, the improvement comprising a group of said sheet-form transmission lines assembled in face-to-face relationship, in which a said broad face of one of the conductors of any given transmission line in said group lies in a substantially parallel, coextending relationship to a corresponding face of the next adjacent transmission line, each said transmission line having at its discharge gap a radiation transmitting aperture having an optical axis normal to and extending through the planes of the conductors, the second conductors of said transmission lines being electrically continuous past said apertures while being isolated from said apertures to prevent discharge through said apertures between said first and second conductors, the optical axes of said apertures of said transmission lines being aligned to define an optical path normal to the faces of said transmission lines, passing through said lasing gas present at said discharge gaps, and means for causing coordinated discharge of said transmission lines to excite gas at said gaps to form a lasing pulse moving along said optical path.

4,093,928

MICROSTRIP HYBRID RING COUPLER

David Proctor, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1976, Ser. No. 752,646
Int. Cl.[2] H01P *5/22*
U.S. Cl. 333—11 13 Claims



10. A microwave, microstrip hybrid ring coupler comprising:

a planar dielectric sheet having first and second opposing faces;

a ground plane conductor supported on said dielectric sheet second face;

first and second input-output strip conductor tabs supported on said dielectric sheet first face and defining a first common axis;

third and fourth input-output strip conductor tabs supported on said dielectric sheet first face and defining a second common axis orthogonally disposed relative to said first common axis;

a substantially circular strip conductor connected in common to each said input-output strip conductor and having a pair of ends defining a gap therein; and

first and second parallel-coupled strip conductors for introducing a 180° phase reversal for signals propagating therethrough, each connected to one of said pair of ends, said first and second strip conductors being connected to each other and being entirely disposed on said dielectric sheet first face.

4,093,929

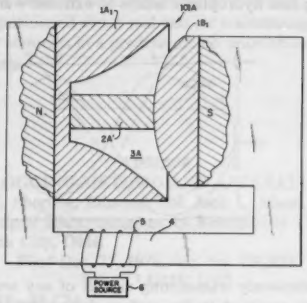
METHOD OF SYNTHESIZING CYLINDRICALLY SYMMETRIC STATIC MAGNETIC FIELDS IN A LOCALLY SATURATED MAGNET AND APPARATUS PROVIDING SAID FIELDS

Frederick R. Morgenthaler, Wellesley Hills, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 24, 1975, Ser. No. 634,676
Int. Cl.[2] H01P *1/18, 1/20, 9/30;* H01F *3/10*
U.S. Cl. 333—31 R 22 Claims

1. Apparatus that comprises, in combination: a magnetic material; and means creating a magnetic bias field H_{BFR} in the region of the magnetic material of sufficient intensity to effect local saturation of the magnetic material, the shape and magnetic characteristics of the magnetic material and the contours of the magnetic bias field H_{BFR} acting, in combination, to provide a spatially non-uniform internal magnetic field H_{IR} of predetermined exacting characteristics within the magnetic

material, said means creating a magnetic bias field H_{BFR} comprising a plurality of high permeability magnetic pole pieces



whose surface contours or pole faces are disposed along at least two equipotentials ψ_{IR} of said magnetic bias field H_{BFR}.

4,093,930

RADIO TUNING ARRANGEMENT

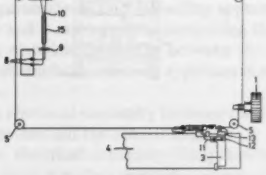
Manfred Flügge, Nuremberg, Germany, assignor to Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig, Germany

Filed Feb. 28, 1977, Ser. No. 772,519

Claims priority, application Germany, Mar. 16, 1975, 7608023[U]

Int. Cl.[2] H03J *1/02*

U.S. Cl. 334—86 5 Claims



1. A radio tuner arrangement for use with a radio of the type wherein tuning is accomplished by the rotation of a knob which, in turn, rotates a variable condenser drum via a cable, said arrangement comprising: a tuning scale; an indicator disposed for movement along said scale; a lamp mounted to said indicator for movement therewith; a drive cable extending in a closed path between said drum, knob and indicator, said drive cable having sections thereof wound about said drum and knob, said drive cable further including a pair of insulated conductors each having a first end extending off said drum longitudinally and affixed to a terminal post and an opposite end connected to said lamp, said conductors extending off said drum circumferentially to said indicator from opposite sides of said path; said conductors being fixed to an end of said drum and extending beyond said drum end to clamp means positioned between said terminal post and drum whereby to define a torsion section in said cable between said drum end and said clamp means.

4,093,931

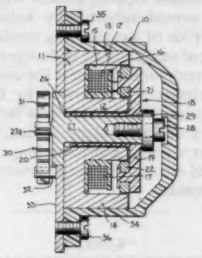
MAGNETIC ARMATURE PIECE FOR ROTARY SOLENOID

Alvin P. Fenton, Oostburg, Wis., assignor to Kohler Co., Kohler, Wis.

Filed May 19, 1977, Ser. No. 798,293

Int. Cl.[2] H01F *7/14*

U.S. Cl. 335—272 2 Claims



1. In a rotary solenoid which includes a stationery "E"-shaped electromagnet having a central axial hub with a central axial opening, a pair of opposed axially extending poles and a circular channel between said hub and said poles,

a solenoid coil positioned in said channel about said hub, and an armature assembly having a rotor, an output shaft affixed to the rotor which extends through the axial opening in the hub and a pair of diametrically opposed magnetic poles, the improved armature assembly in which:

(a) the output shaft is formed integral with the rotor;

(b) the poles are joined in a fixed relationship by relatively thin bridges to form a unitary magnetic armature piece; and

(c) the magnetic armature piece and the rotor are each provided with alignment means which cooperate to properly align the magnetic armature piece on the rotor.

4,093,932

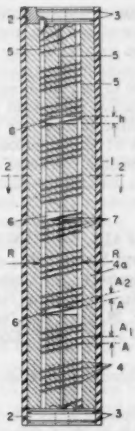
ELECTRIC ALL PURPOSE FUSE

Frederick J. Kozacka, South Hampton, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 7, 1977, Ser. No. 775,248

Int. Cl.[2] H01H *85/04, 85/12*

U.S. Cl. 337—161 4 Claims



1. A miniature fuse for elevated voltages calling for series

multibreaks for the interruption of small overload currents comprising

(a) a tubular casing of electric insulating material having a length of about 8–15 inches;

(b) a pair of terminal elements closing the ends of said casing;

(c) a granular quartz filler inside said casing;

(d) a plurality of wire-like fusible elements whose cross-sectional area changes periodically conductively interconnecting said pair of terminal elements, said plurality of fusible elements being stampings of sheet metal;

(e) a fusible element support around which said fusible elements are wound substantially helically, said support comprising rods of gas-evolving insulating material; and

(f) the spacing of said plurality of fusible elements being such that initial break formation near the center of said plurality of fusible elements is followed by voltage surges and concomitant electric breakdowns between windings of said plurality of fusible elements and hence formation of series breaks without shortcircuiting and formation of a self-sustained electric discharge between said plurality of fusible elements.

4,093,933

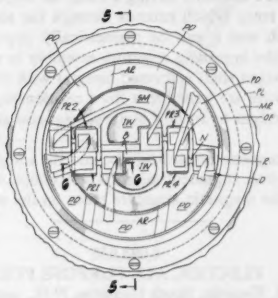
SCULPTURED PRESSURE DIAPHRAGM

Leslie B. Wilner, Palo Alto, Calif., assignor to Becton, Dickinson Electronics Company, San Juan Capistrano, Calif.

Filed May 14, 1976, Ser. No. 686,419

Int. Cl.[2] H01L *10/10*

U.S. Cl. 338—42 **11 Claims**



1. In a pressure transducer,

a diaphragm composed of a nonmetallic material, said diaphragm having at least two elongated slots separating thick rigid portions therein and forming at least two respective thin flexures joining said thick rigid portions whereby deflection of said diaphragm causes said flexures to bend about axes parallel to their lengths, and

strain sensitive means comprising piezoresistive semiconductive means secured to said diaphragm opposite one of said slots to detect relative movement of parts of the corresponding thin flexure in response to bending thereof to change resistance of said semiconductive means by an amount corresponding to a pressure change.

4,093,934

FREE-FALLING SONOBUOY

Robert J. Urick, Silver Spring, Md., and Robert L. Parris, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1965, Ser. No. 452,460

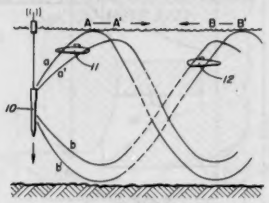
Int. Cl.[2] H04B *11/00;* **G01S** *9/66*

U.S. Cl. 340—2 **9 Claims**

1. The method of detecting underwater vessels comprising the steps of:

submerging a hydrophone array characterized by its ability to receive sound emanating from vessels in the annular zone defined by a conical pencil of rays upwardly divergent from the array and a hydrophone array characterized by its ability to receive sound emanating from vessels in the annular zone defined by a conical pencil of rays downwardly divergent from the array,

lowering said hydrophone arrays to extreme water depths,



and continuously transmitting signals of any sound waves thereby received to the surface during the lowering of said arrays,

whereby a complete acoustic scan of the entire volume of the sea out to substantial ranges is thus acquired.

4,093,935

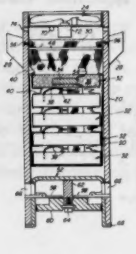
EXPANDABLE TRANSDUCER ARRAY

Charles W. Ouellette, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 682,422, May 3, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 792,439

Int. Cl.[2] H04B *13/00*

U.S. Cl. 340—8 S **3 Claims**



1. A transducer system comprising:

a housing having an opening in an end thereof;

floatation means secured to said housing at an end thereof opposite said opening for floating said housing in a fluid medium;

an array of transducer elements arranged along a central axis of said array;

a cap closing said opening for securing said transducer elements within said housing, said cap being released upon impact with said fluid, said transducer elements being slidably secured within said housing to permit their exit via said opening upon said releasing of said cap;

spring means for expanding said array of transducer elements subsequent to their exit from said housing; and

a flexible enclosure extensible through said opening and secured to said housing, said housing surrounding said array for constraining said transducer elements against forces of said spring means to occupy predetermined

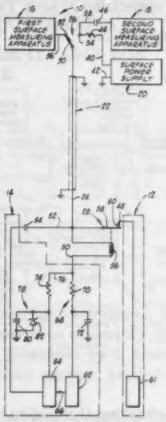
locations upon the expansion of said array, said enclosure having apertures therein for admission of said fluid to contact said elements for communication of radiation thereto, said spring means comprising spring elements located between said transducer elements and symmetrically positioned about said axis for maintaining said transducer elements in a predetermined orientation relative to said axis.

4,093,936

LOGGING METHOD AND APPARATUS

Howard C. Eberline, Edmond, and Jack L. Moon, Oklahoma City, both of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Dec. 27, 1976, Ser. No. 754,922
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 CM 12 Claims



10. A logging method utilizing a first downhole logging device, a second downhole logging device, a first surface measuring apparatus, a second measuring apparatus, a surface power supply and a coaxial cable, comprising the steps of:

establishing electrical continuity between the coaxial cable and the first surface measuring apparatus in a first mode of operation;

establishing electrical continuity between the first downhole logging device and the coaxial cable in the first mode of operation, electrical continuity being thereby established between the first surface measuring apparatus and the first downhole logging device via the coaxial cable in the first mode of operation;

establishing electrical continuity between the second surface measuring apparatus and the coaxial cable and about simultaneously interrupting electrical communication between the first surface measuring apparatus and the coaxial cable in a second mode of operation;

establishing electrical continuity between the surface power supply and the coaxial cable in the second mode of operation; and

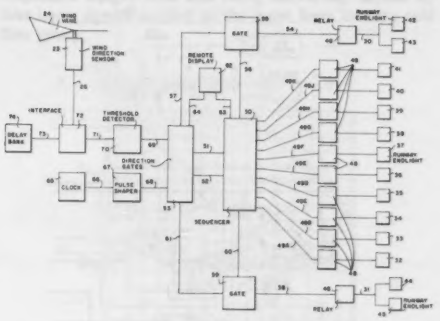
establishing electrical continuity between the second downhole logging device and the coaxial cable in response to electrical continuity being established between the surface power supply and the coaxial cable, thereby establishing electrical continuity between the second surface measuring apparatus, the surface power supply and the second downhole logging device in the second mode of operation.

4,093,937

AUTOMATIC RUNWAY TRAFFIC DIRECTION CONTROL

Max Habinger, P.O. Box D, 500 Leo Ave., Landing, N.J. 07850

Filed May 24, 1976, Ser. No. 689,483
Int. Cl.[2] G08G *5/00*
U.S. Cl. 340—26 3 Claims



1. A bidirectional sequential flashing light system for use in an airport runway lighting system comprising:

an opto electronic wind direction sensing means generating an output signal indicative of the direction,

bidirectional counting means,

said counting means responsive to said sensor output signal to count in a forward or reverse direction,

flashing airport runway light means including a plurality of runway lights,

solid state switch activating means responsive to the direction of said bidirectional counting means count,

said light means connected to said switch means whereby the plurality of lights are activated in a sequential order thereby indicating the direction of the wind.

4,093,938

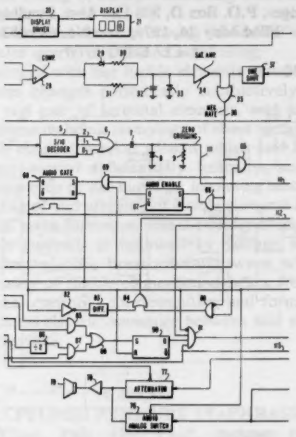
AIRCRAFT ALTITUDE ANNUNCIATOR

Michael A. Argentieri, West Orange, and James Lionetti, Northvale, both of N.J., assignors to Intercontinental Dynamics Corp., Englewood, N.J.

Filed Oct. 18, 1976, Ser. No. 733,180
Int. Cl.[2] G08G *5/00*
U.S. Cl. 340—27 R 18 Claims

1. A system for use in an aircraft to announce altitude-related messages, said aircraft having means for generating a signal representative of the aircraft altitude, said system comprising means for storing a plurality of verbal messages, at least some of said messages corresponding to respective aircraft altitudes, means for playing a selected one of said messages, means for selecting one of said messages when the altitude represented by said altitude signal is in a respective range of a first group of ranges, a different range in said first group being associated with each message and all of the ranges being disconnected from each other, means for deriving a negative-rate signal representative of a decreasing altitude, means responsive to the simultaneous derivation of said negative-rate signal and the operation of said message-selecting means for controlling said message-playing means to play the selected message and thereafter for disabling subsequent operation of said message-playing means independent of another operation of said message-selecting means, a second group of ranges all disconnected from each other and all disconnected from the ranges in said first group, the ranges in said first and second groups alternating with each other in the order of increasing altitudes, and means responsive to said altitude signal representing an altitude

in one of the ranges in said second group adjacent the range in said first group in accordance with which the last-played mes-



sage was selected for enabling subsequent operation of said message-playing means.

4,093,939

ACCESSORY FOR A VEHICLE FOR MONITORING ITS OPERATION AND THAT OF ITS DRIVE MEANS

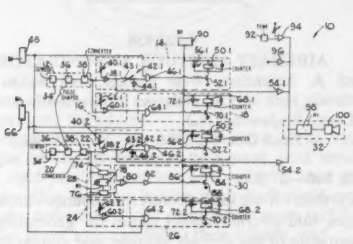
Neville Herbert Mitchell, Johannesburg, South Africa, assignor to Transputer (Proprietary) Limited, Johannesburg, South Africa

Filed Feb. 16, 1977, Ser. No. 769,272

Claims priority, application South Africa, Feb. 18, 1976, 76/0973

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **7 Claims**



1. An accessory for a vehicle having a drive means, the accessory including

a vehicle speed sensing means for sensing the travelling speed of the vehicle and for providing a vehicle speed signal;

a differentiating means for differentiating the vehicle speed signal with respect to time to provide an acceleration signal representative of the linear acceleration of the vehicle;

a vehicle overspeed recording means responsive to the vehicle speed sensing means for recording the amount of time that the vehicle is driven at a speed greater than a predetermined speed;

a vehicle excessive acceleration recording means responsive to the differentiating means for recording the amount of time that the vehicle is accelerated at an acceleration greater than a predetermined value;

a vehicle operating time recording means responsive to the vehicle speed sensing means for recording the amount of time the vehicle is in motion;

a drive means operating speed sensing means for sensing the operating speed of the drive means and for providing a drive means speed signal;

a drive means overspeed recording means responsive to the drive means speed sensing means for recording the amount of time that the drive means is operated at a speed greater than a predetermined speed; and

a drive means operating time recording means responsive to the drive means speed sensing means for recording the amount of time the drive means is in operation.

4,093,940

SYSTEM AND EQUIPMENT FOR QUALITY CHECKING OF A DIGITAL CONNECTION CIRCUIT

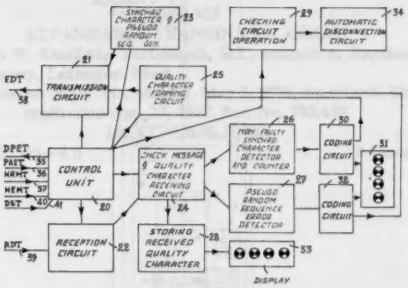
Maurice Maniere, Conflans-Sainte-Honorine, France, assignor to Lignes Telegraphiques et Telephoniques, Paris Cedex, France

Filed Feb. 15, 1977, Ser. No. 768,782

Claims priority, application France, Feb. 27, 1976, 76 05615

Int. Cl.² G08C *25/00*

U.S. Cl. 340—146.1 E **6 Claims**



1. A system for checking the quality of a digital connection circuit comprising:

a first device including transmitting and receiving means connected to the first end of said circuit for respectively transmitting a check message and a quality character sent in a given direction of said circuit under test during transmit cycles assigned to said first device and receiving a check message and a quality character sent in the other direction of said circuit under test during receive cycles assigned to said first device;

a second device identical to the first device including transmitting and receiving means connected to the second end of said circuit for respectively transmitting a check message and a quality character sent in said other direction of said circuit under test during transmit cycles assigned to said second device and coinciding with the receive cycles assigned to the first device and receiving a check message and a quality character sent in the given direction of said circuit under test during receive cycles assigned to said second device and coinciding with the transmit cycles assigned to the first device;

control units respectively connected to the ends of said digital connection circuit including means for periodically switching said first and second devices to thereby reverse transmission and reception;

each of said control units including means for respectively generating, transmitting and receiving a synchronization character having *i* bits repeated *n* times and forming the first part of said check message and further including means for respectively generating, transmitting and receiving a pseudo-random sequence of *p* bits, forming the second part of said check message, each covering one

further bit interval immediately following said synchronization character;

store means connected to said control units for storing said received synchronization character, pseudo-random sequence and quality character;

error detector means and coding means connected to said store means, deriving from the errors in said received synchronization characters and pseudo-random sequence a coded result forming the quality character;

display means for displaying the quality character received in each of said device during the receive cycle wherein it is received;

and means for adding said quality character to the check message transmitted by each of said device during the transmit cycle following that wherein it is received.

4,093,941

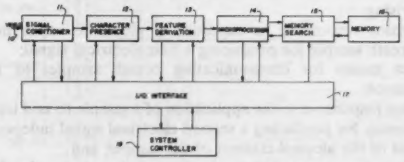
SLOPE FEATURE DETECTION SYSTEM

Larry Wayne Bryan, Arlington; David Paul Himmel, and George William Woster, Jr., both of Dallas, all of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Dec. 9, 1976, Ser. No. 749,200

Int. Cl.[2] G06K *9/16*

U.S. Cl. 340—146.3 AE **14 Claims**



1. A method of detecting descriptive features of binary images of characters stored in a memory means formed from sensor cell responses generated by a sensor array scanning handprinted and multifont machine printed characters, which comprises:

(a) generating first signals representing the outer boundaries and inner loops of said characters by a vector control means in communication with said memory means;

(b) generating second signals which are vector representations of said boundaries by a trace control means receiving said first signals, each of said representations comprising one of a set of a plurality of equally divergent vectors;

(c) generating a first set of indicia representative of said characters representing averages of selected sets of said second signals by said trace control means;

(d) reducing each character to a one-cell stroke width by said vector control means and generating a second set of indicia representative of reduced ones of said characters from third signals produced by said vector control means tracing the outer boundary of said reduced ones.

4,093,942

MATRIX CIRCUITS

Yasoji Suzuki, Kanagawa; Yoshio Kaneko, Kawasaki, and Yoshihisa Shiotari, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 693,121

Claims priority, application Japan, Jun. 5, 1975, 50-67870; Jun. 20, 1975, 50-74375; Jun. 25, 1975, 50-77563

Int. Cl.[2] H04Q *3/00*

U.S. Cl. 340—166 R **6 Claims**

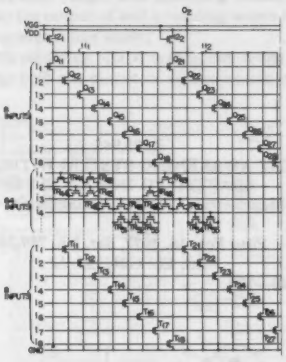
1. A read-only memory matrix circuit comprising:

a first group of input lines, a second group of input lines, a third group of input lines and a plurality of groups of output lines intersecting the input lines of the first, second and third groups to form a matrix array,

the third group of input lines being arranged in the matrix array between the first and second groups of input lines,

each of the plurality of groups of output lines having a common terminal connected to one end of a power source and another common terminal connected to ground,

a plurality of first switching elements, individual ones of the plurality of first switching elements being connected to respective output lines and being selectively driven by first input signals applied to the input lines forming said first group,



a plurality of second switching elements, respective ones of which are driven by the same first input signals applied to the plurality of first switching elements and are connected to the output lines consecutively located next in the matrix array relative to the output lines in which the first switching elements are connected, and

a plurality of third switching elements, individual ones of which form different combinations connected between adjacent output lines and are selectively driven by second input signals applied to the third group of input lines.

4,093,943

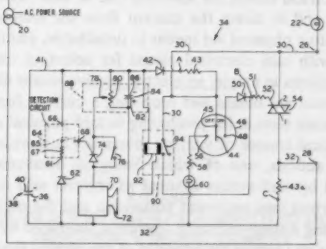
SEQUENTIAL POWER DISTRIBUTION CIRCUIT

Webster B. Knight, 2320 Abbey - No. 6, Fort Wayne, Ind. 46815

Filed Dec. 27, 1976, Ser. No. 754,103

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—220 **20 Claims**



1. A power distribution circuit comprising; a power source; a primary load being coupled to and selectively energizable by said source;

an energy reserve having a predetermined reserve capacity;

first means for coupling said source to said reserve to provide said reserve with a flow of energy with the flow and accumulation of said flow being limited by said capacity when said load is not being energized;

second means for retaining said energy in said reserve when said load is being energized by said source;

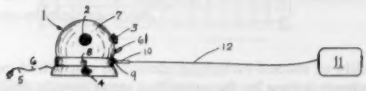
a secondary load being coupled to the energy in said reserve;
third means coupled to said reserve for generating a signal upon the sensing of a predetermined condition;
fourth means coupled to said reserve and secondary load and operable by said signal and said reserve for power coupling said secondary load to said power source upon generation of said signal.

4,093,944

SILENT AWAKENING SYSTEM WITH MEANS ADAPTED TO INDUCE SLEEP

Hrand M. Muncheryan, 1735 N. Morningside St., Orange, Calif. 92667

Filed Feb. 16, 1977, Ser. No. 769,344
Int. Cl.[2] G04C *23/12*
U.S. Cl. 340—279 **20 Claims**



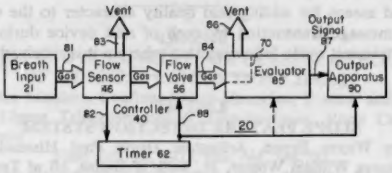
1. A silent awakening system with means adapted to induce sleep in a person, said system comprising: a first means for producing an electrical signal and being energized for quiescent operation thereof from an external source of current, a second means for receiving and directing said electrical signal through an electrical transmission medium to an electrical signal receiving means electrically coupled thereto; said second means having therein a circuit adapted to process said electrical signal into a continuous flow of direct current, and means disposed in said circuit for channeling said direct current into two circuit sections; one of said circuit sections is adapted to conduct said continuous flow of direct current and having therein a control means to vary the current flow therethrough, and the other circuit section having means therein to convert said continuous direct current into recurrent pulsations; electrical means for selecting one of said circuit section at a time and to direct the current from the selected circuit section into a physical aid means in detachable, electrical connection with said electrical means for selecting one of said circuit sections at a time; an electric motive means disposed in said physical aid means and receiving a current from the selected circuit section for producing in said physical aid means a mechanical tremor of varying intensities comprising of two types of actions, one of which being an awakening action produced by said means adapted to convert said continuous direct current into recurrent pulsations, and the other type of action being a sleep-inducing operation produced by said control means by varying the intensity of the current therethrough and thereby the intensity of tremor produced in said physical aid means to suit the user thereof, said two types of mechanical actions occurring independently of each other therein; and, a current outlet means, disposed in the circuit of said second means and connected to receive a current from an external 115-volt source, is provided with a current interrupter in the circuit thereof to produce therein a recurrently interrupted electrical current and to transmit said current to a standard electric lighting means electrically connected to said current interrupter, causing said standard electric lighting means to emit a recurrently flashing light therefrom.

4,093,945

BREATH TESTING SYSTEM

Donald W. Collier, Chicago; Joseph P. Hoppesch, Streamwood, and Anthony C. Mamo, Arlington Heights, all of Ill., assignors to Alcohol Countermeasure Systems, Inc., Sarnia, Canada

Filed Apr. 23, 1971, Ser. No. 136,921
Disclosure was also published under second Trial Voluntary Protest Program on May 29, 1976
Int. Cl. B60k *27/08*; G08b *21/00*
U.S. Cl. 340—279 **34 Claims**



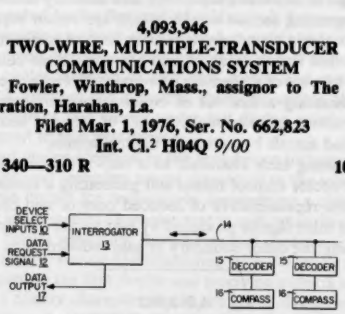
34. A breath alcohol detection system for motor vehicles comprising:
a sensor responsive to exposure to alcoholic vapor in a breath sample for producing a first electrical signal;
input means for communicating breath samples to the sensor;
means responsive to the application of a sample to said input means, for producing a second electrical signal independent of the alcohol content of the sample; and
logic means connected to simultaneously receive the first and second signals for producing an output condition to enable normal vehicle operation only when the combination of the first and second signals indicates a breath sample having less than a predetermined alcoholic content.

4,093,946

TWO-WIRE, MULTIPLE-TRANSDUCER COMMUNICATIONS SYSTEM

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.

Filed Mar. 1, 1976, Ser. No. 662,823
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—310 R **10 Claims**



1. A system responsive to data request signals for retrieving data from a selected one of a plurality of data gathering devices remotely located and connected in parallel to a single cable, comprising:
an interrogator responsive to data request signals including:
means for transmitting an address signal along the cable indicative of the particular data gathering device from which data is to be retrieved; and
means for applying a constant signal to the cable after the address signal has been transmitted;
one or more decoders each associated with a corresponding data gathering device and each including:

means for comparing the address signal transmitted along the cable with an identification signal uniquely identifying the decoder to produce an enabling signal upon correspondence thereof for activating the corresponding data gathering device; and

corresponding means responsive to the enabling signal for selectively connecting a low impedance across the cable conductors in response to digital data from the data gathering device;

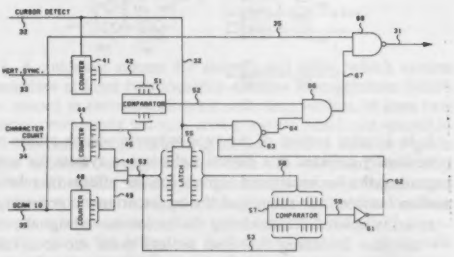
the digital data from the selected data gathering device being reproduced at the interrogator by detecting the variations in the signal level across the cable produced by the responding means.

4,093,947

RASTER DISPLAY POSITION DETECTION

Charles C. Habeger, Jr., and Dennis A. Quy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1976, Ser. No. 755,761
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD **29 Claims**



1. In a display system wherein a luminescent display is generated by raster scanning having a plurality of scans in a first direction during each successive scan in a transverse direction which is generally perpendicular to said first direction, said display having at least one row of successive data locations along said first direction of said display, a method for communicating the position of a target data location selected from said data locations, said method comprising:

superimposing over said display a luminescent cursor associated with preselected, periodic, non-successive data locations in each said row of data locations;

shifting each said cursor a preselected number of data locations along each said row thereof during each of a preselected number of preselected scans in said transverse direction to provide display of a cursor associated with each said data location of said display at least once during a preselected cursor cycle;

maintaining a signal message representative of the position of the data location which has most recently had a cursor associated therewith; and

initiating communication of the signal message representative of said target data location in response to the sensing of luminance produced by a cursor associated therewith.

4,093,948

TARGET DETECTION IN A MEDIUM PULSE REPETITION FREQUENCY PULSE DOPPLER RADAR

William H. Long, III, Bowie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1976, Ser. No. 693,988
Int. Cl.[2] G01S *7/28, 9/02, 9/42*
U.S. Cl. 343—7 A **10 Claims**

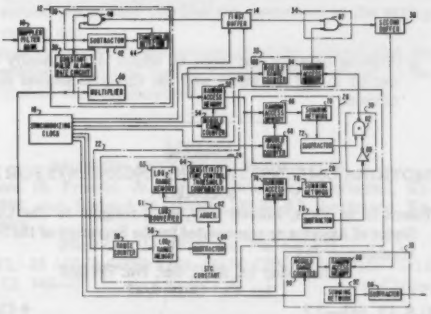
1. A pulse doppler radar receiver for detecting the range of a target from received signals which include target returns, a main beam clutter returns, area sidelobe clutter returns and discrete sidelobe clutter returns, said receiver comprising:

means for filtering the main beam clutter returns from said received signals;

means for providing an adaptive threshold signal which varies in response to the amplitude of the area sidelobe clutter returns, said providing means being responsive to said filtering means to remove said area sidelobe clutter returns from said received signals;

means for unfolding the output of said providing means over a predetermined range, said unfolding means being responsive to the output of said providing means to provide an unambiguous range signal;

means for thresholding the unambiguous range signal in response to both the output of said unfolding means and



the adaptive threshold signal of said providing means, the threshold being such that the discrete sidelobe clutter returns are rejected over a selected range of said unambiguous range signal;

means for detecting discrete sidelobe clutter returns in the unambiguous range signal of said unfolding means, said detecting means being responsive to said unfolding means and to said thresholding means to provide a blanking signal;

means for blanking the discrete sidelobe clutter returns detected by said detecting means from the output of said providing means, said blanking means being responsive to said detecting means to provide the target returns of the received signals; and

means for determining the range of the target in response to said target returns provided by said blanking means.

4,093,949

CLUTTER TRACKER USING A SMOOTHED DOPPLER FREQUENCY MEASUREMENT

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

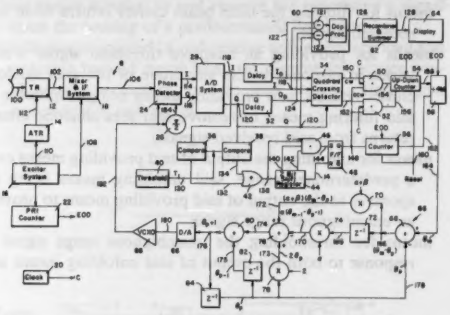
Filed May 26, 1976, Ser. No. 690,330
Int. Cl.[2] G01S *9/02, 9/42*
U.S. Cl. 343—7 A **13 Claims**

1. A radar clutter tracker system responsive to clutter frequencies, said system having a dual channel delay subsystem, comprising the combination:

a dual channel analog-to-digital converter fed by a pair of quadrature signals;

a first digital circuit electrically connected to the converter;

a second digital circuit electrically connected to the converter; and



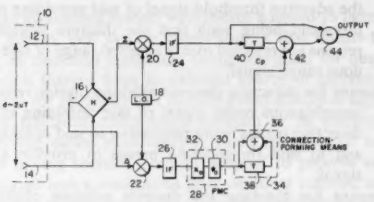
a crossing detector the input of which is electrically connected to the converter and the first and second digital circuits.

4,093,950

MOTION-COMPENSATION ARRANGEMENTS FOR MTI RADARS

Tomos L. ap Rhys, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1977, Ser. No. 797,209
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 9 Claims



1. In radar system of the type wherein search pulses are periodically radiated in a directional beam, a system for compensating backscattered signals for the effects of the radar's motion comprising:

an array antenna for receiving the backscattered signals including first and second sub-arrays for forming similarly-shaped first and second receive beams, the lines of center of said first and second receive beams at the array being separated by a predetermined amount;

first forming means coupled to said first and second sub-arrays for forming sum and difference outputs of the signals received;

first optimization means coupled to receive difference signals corresponding to the difference output of said first forming means for adjusting the difference signals in phase and amplitude;

first correction-forming means receiving the output of said first optimization means as an input, said first correction-forming means delaying its input signal for an interpulse period and adding the delayed input signal to the following input signal to produce a correction signal at its output;

a first delay circuit coupled to receive sum signals corresponding to the sum output of said first forming means as its input, said first delay circuit delaying its input signal for an interpulse period; and

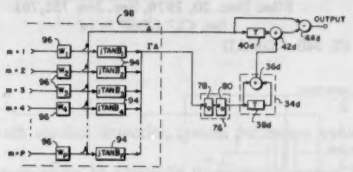
a first addition circuit having a first input coupled to the output of said first correction-forming means and a second input coupled to the output of said first delay circuit, the output of said first addition circuit being a signal which in synchronized in time and phase with the signal in the sum output of said first forming means.

4,093,951

COMPENSATION FOR SIMULTANEOUS PLATFORM MOTION AND ANTENNA SCANNING IN MTI RADARS

Tomos L. ap Rhys, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1977, Ser. No. 797,207
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 6 Claims



1. In a radar system of the type wherein search pulses are periodically radiated in a directional beam, a system for compensating the backscattered signals for the effects of relative motion between the radar and the backscatterer comprising:

an array antenna for receiving the backscattered signals, said antenna including first and second main sub-arrays for forming first and second similarly-shaped receive beams, the distance between the lines of center of said first and second receive beams at the antenna being related to a predetermined linear velocity of the radar and to the interpulse period, the lines of center of said first and second receive beams being parallel, said antenna including first and second auxiliary sub-arrays for forming third and fourth similarly shaped receive beams, the angle between the lines of center of said first receive beam and said third receive beam being related to the angular velocity of the radar and to the interpulse period, the lines of center of said first receive beam and said third receive beam intersecting at the antenna, the angle between the lines of center of said second receive beam and said fourth receive beam being related to the angular velocity of the radar and to the interpulse period, the lines of center of said second receive beam and said fourth receive beam intersecting at the antenna;

first scanning-motion-compensation optimization means coupled to receive the output of said first auxiliary sub-array for adjusting the signals from said sub-array in phase and amplitude;

second scanning-motion-compensation optimization means coupled to receive the output of said second auxiliary sub-array for adjusting the signals from said sub-array in phase and amplitude; and

means for generating a delayed compensated signal that is synchronized in time and phase with the sum of the undelayed signals from said first and said second main sub-arrays, said means for generating receiving the outputs of said first main sub-array, said second main sub-array, said first scanning-motion-compensation optimization means, and said second scanning-motion-compensation optimization means as inputs, the output of said means for generating being said delayed, compensated signal.

4,093,952

GUIDANCE SYSTEMS

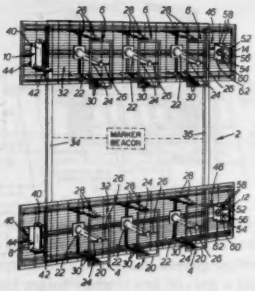
Frank Howard Taylor, London, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Sept. 14, 1976, Ser. No. 723,286

Claims priority, application United Kingdom, Sep. 16, 1975, 37976/75

Int. Cl.[2] G01S *1/10, 1/18*

U.S. Cl. 343—108 R 11 Claims



1. A guidance system for aircraft and ships, which system comprises at least two localiser antenna arrangements which are spaced in elevation above a reflecting surface, at least two distance measuring antenna arrangements which are spaced in elevation above the reflecting surface, and at least two glide slope antenna arrangements which are mounted vertically above each other, means for mounting said antenna arrangements on a common support structure such that the localiser antenna arrangements are at a mean height of at least 2½ wavelengths above the reflecting surface and are fed with signals having the same radio frequency but having a phase difference, the distance measuring antenna arrangements are at a mean height of at least 25 wavelengths above the reflecting surface and are fed with signals having the same radio frequency but having a phase difference, and the glide slope antenna arrangements are fed with signals having the same radio frequency but two different frequencies of amplitude modulation to give by reflection from the reflecting surface at least two consecutive glide slopes in the same sense.

4,093,953

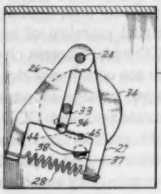
CONTROL STICK ASSEMBLY FOR RADIO CONTROL EQUIPMENT

Carl A. Hammons, Vista, and Philip O. Kraft, Oceanside, both of Calif., assignors to Kraft Systems, Inc., Vista, Calif.

Continuation-in-part of Ser. No. 563,380, Mar. 31, 1975. This application Mar. 8, 1976, Ser. No. 664,867

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—225 16 Claims



1. A control stick assembly comprising:

a movable control stick;

first and second movable lever arms;

means for urging the first and second lever arms together;

a normally latched movable member;

a first pin attached to the control stick and disposed between the first and second lever arms, the first pin being movable as the control stick moves to carry the first lever arm away from the second lever arm in opposition to the urging means when the movable member is latched, thereby resisting movement of the control stick;

the normally latched movable member being adapted to track the movement of the first pin when unlatched;

a second pin attached to the normally latched, movable member and disposed between the lever arms, the second pin being movable as the movable member moves when unlatched to permit the urging means to move the second lever arm toward the first lever arm, but being stationary and preventing the urging means for moving the second lever arm toward the first lever arm when the movable member is latched;

means for unlatching the movable member to move the second pin toward the first pin responsive to the urging means; and

means responsive to the movement of the control stick for producing a signal having a characteristic related to the control stick displacement.

4,093,954

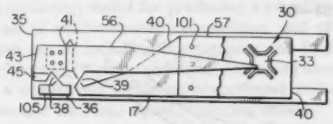
MOTION RECORDER INDICATOR

Richard H. Prewitt, Jr., 439 N. Broadway, Lexington, Ky. 40508, and Richard H. Prewitt, R.R. #3, Lexington, Ky. 40505

Filed Oct. 14, 1975, Ser. No. 622,221

Int. Cl.[2] 33 *147 D;* G01D *9/00, 15/16;* G01B *5/00;* F16F *11/18*

U.S. Cl. 346—7 16 Claims



1. An instrument comprising a first and second support means, marking means actuated by movement between said first and second support means, a target for recording the movement between said first and second support means, said target being mounted on said second support means, said marking point engaging said target and attached to a lever comprising a thin flat sheet of material attached to said second support means through a flat flex pivot, said flex pivot formed in said flat sheet by removing material to form a hub and spokes.

4,093,955

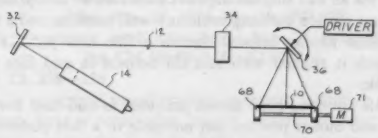
WELL-LOGGING CAMERA USING MODULATED LASER LIGHT PATH FOR EXPOSING IN CAMERA PROCESSABLE ELECTROGRAPHIC FILM

Lee Roy Brown, and Thomas M. Davison, both of Houston, Tex., assignors to Sie, Inc., Fort Worth, Tex.

Filed Oct. 8, 1976, Ser. No. 730,743

Int. Cl.[2] G03G *13/06*

U.S. Cl. 354—3 12 Claims



1. A camera for producing well logging format with traces on a continuous strip of film in an online capacity from a computer controlled system, comprising:

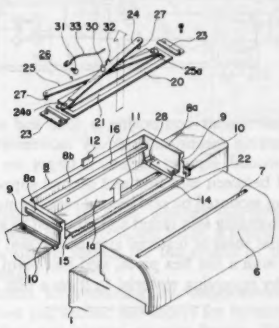
a housing;

a roll of electrophotographic film mounted in the housing;
corona means for charging the film to a controlled level;
a helium neon laser providing a continuous beam of coherent light in the red spectrum;
an acousto-optical modulator producing a modulated light path;
a galvanometer driven oscillating mirror delivering the modulated light to the charged film in the form of a digital image;
developing means presenting the toner to the exposed areas of the film;
edge driving means precisely moving the film through the modulated light path and through the developing means; and
fusing means permanetizing the developed image.

4,093,956
AUTO-PROCESS CAMERA

Toshio Goto, Omiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 28, 1977, Ser. No. 782,128
Claims priority, application Japan, Apr. 2, 1976, 51-37911
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—86 4 Claims

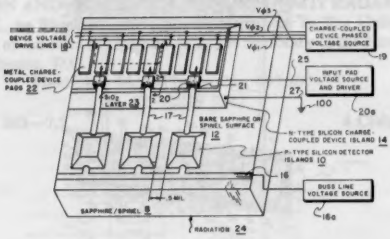


1. In an auto-process camera employing film in the form of individual film units contained in a pack loaded in said camera, forwarding means which subsequent to exposure of each film unit move said film unit separately from said pack via a slit defined in said pack and into engagement with a processing roll unit to cause processing solution to be spread through said film unit to develop a latent image carried by said film unit and simultaneously forward said film unit to the exterior of said camera via an exit slit, the improvement further comprising
a mount portion defining enclosure wall portions and a base portion having defined therein a film unit passage slit which is aligned with said slit defined in said film unit pack;
slidable covering plate means provided in said base portion of said mount portion and movable to a first position in which said plate covers said film unit passage slit and to a second position in which said plate uncovers said slit; and
positioning means connected to said covering plate means and being actuable to move said covering plate to said first position or to said second position.

4,093,957
SOS EXTRINSIC INFRARED DETECTOR AND READ-OUT DEVICE

Gerard J. King, Alexandria, and Joseph F. Martino, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 15, 1976, Ser. No. 705,641
Int. Cl.[2] H01L *29/78, 27/14*
U.S. Cl. 357—24 8 Claims


CHARGE-COUPLED DEVICE PHASED VOLTAGE SOURCE
INPUT PAD VOLTAGE SOURCE AND DRIVER
METAL CHARGE-COUPLED DEVICE PADS 22
BARE SAPPHIRE OR SPINEL SURFACE
N-TYPE SILICON CHARGE-COUPLED DEVICE ISLAND 14
P-TYPE SILICON DETECTOR ISLANDS 10
BUSS LINE VOLTAGE SOURCE
SAPPHIRE/SPINEL 8
RADIATION 24

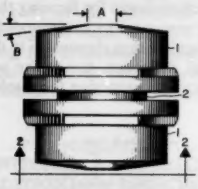
1. An extrinsic silicon infrared detector array and charge-coupled device readout comprising:
a layer of electrical insulator substrate material;
a plurality of extrinsic silicon detectors mounted on the bare surface of one side of said substrate material, wherein said plurality of extrinsic silicon detectors are doped for sensitivity in the infrared wavelength region;
a silicon CCD signal readout structure mounted on the bare surface of said one side of said substrate material in proximity to but isolated from said plurality of extrinsic silicon detectors;
a plurality of input diffusions deposited in said silicon CCD signal readout structure;
a buss line voltage source commonly connected to the input side of all of said plurality of extrinsic silicon detectors;
an insulating layer deposited over all of said silicon CCD signal readout structure except over said plurality of input diffusions;
a plurality of conductive leads electrically connected from an output side of said plurality of extrinsic silicon detectors to said plurality of input diffusions;
a plurality of CCD pads deposited on said insulating layer;
a CCD phased voltage source;
a plurality of CCD voltage drive lines connected between said CCD phased voltage source and said plurality of CCD pads for driving phased voltages across said plurality of CCD pads;
an input CCD pad voltage source and driver; and
a plurality of input structure pads deposited on said insulating layer between said plurality of input diffusions and said plurality of CCD pads, wherein all of said plurality of input structure pads are commonly electrically connected to said input CCD pad voltage source and driver and are intermittently connected to said CCD pads in some selected phasing from each of said plurality of extrinsic silicon detectors wherein said input CCD pad voltage source and driver sequentially switches a voltage on said plurality of input structure pads to readout signals from said plurality of extrinsic silicon detectors caused by infrared radiation coming through said substrate material impinging thereon and injecting said readout signals in the layer of said silicon CCD signal readout structure that is immediately below said intermittently connected CCD pads for signal readout therefrom in some desired mode.

4,093,958

SEMICONDUCTOR DEVICE ASSEMBLY WITH IMPROVED FATIGUE RESISTANCE

Joseph F. Riccio, Jr., Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 9, 1976, Ser. No. 748,791
Int. Cl.[2] H01L 23/48, 29/44, 29/52
U.S. Cl. 357—68 10 Claims



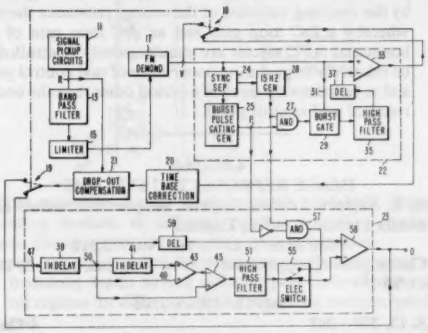
1. An axial-leaded semiconductor assembly comprising conducting studs soldered directly to the major surfaces of a semiconductor chip, each of said studs having a cross-sectional area larger than said major surface and having a tapered extremity away from said surfaces, said assembly being substantially symmetrical about said chip.

4,093,959

CHROMINANCE SIGNAL TRANSCODING APPARATUS

Lee Vern Hedlund, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,538
Claims priority, application United Kingdom, Mar. 8, 1977, 11116/77
Int. Cl.[2] H04N 9/02
U.S. Cl. 358—4 7 Claims



1. Chrominance signal transcoding apparatus, for use with a source of composite video signals representative of successive repetitions of two interlaced image fields constituting a single image frame and comprising a luminance signal component, a chrominance signal component and synchronizing information, including a color burst; said apparatus comprising:

means, responsive to said composite video signal, for identifying the time interval occupied by each image frame;

means, subject to being coupled to the output of said source of composite video signals, for altering the phase of the color burst in response to the output of said time interval identifying means;

circuit means, subject to being coupled to the output of said color burst altering means, including means responsive to the phase of the color burst, for stabilizing the chrominance signal component against spurious frequency variations;

means for effecting signal substitution in response to the detection of a defect in said composite video signal; and

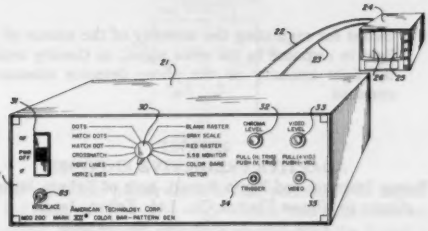
means, subject to being coupled to the output of said circuit means, for altering the phase of the chrominance signal component in response to the output of said time interval identifying means without altering the phase of the color burst.

4,093,960

TEST SIGNAL GENERATING SYSTEM AND METHOD

Earl M. Estes, Canon City, Colo., assignor to American Technology Corporation, Canon City, Colo.

Continuation of Ser. No. 523,775, Nov. 14, 1974, abandoned.
This application Apr. 15, 1976, Ser. No. 677,196
Int. Cl.[2] H04N 9/62
U.S. Cl. 358—10 37 Claims



16. A test signal generating system for use in servicing color TV receivers, said system comprising:

signal producing means for producing a plurality of output signals of predetermined composition, said plurality of output signals including line-scanning and field-scanning synchronizing signals, said signal producing means including a countdown chain having an input and an output connected with said signal producing means;

combining means for combining said plurality of output signals to produce a composite output signal suitable for producing a predetermined test pattern on a TV receiver connected with said test signal generating system, said test pattern being provided for the purpose of monitoring on the image-producing device of said TV receiver an indication of the magnitude of error in the free-running frequency of the color sync oscillator in said TV receiver, said test pattern being produced by including a suitable chroma signal in the composite output signal during the line-scanning interval, and said chroma signal being suppressed to a lower level by suitable means during the sampling interval when the AFPC circuit in said TV receiver being serviced is enabled; and

an oscillator connected with the input of said countdown chain.

4,093,961

OPTICAL READING APPARATUS WITH SCANNER LIGHT INTENSITY CONTROL

Hitoshi Kanamaru, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

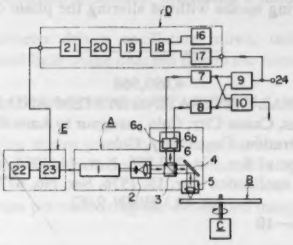
Filed Nov. 18, 1976, Ser. No. 743,025
Claims priority, application Japan, Nov. 21, 1975, 50-139314
Int. Cl.[2] H04N 5/84; G11B 7/12
U.S. Cl. 358—128 2 Claims

1. In an optical signal readout apparatus including a source of laser light, a rotary disc record, a photo detector, and an optical scanner for focusing light from the source onto the record and directing light reflected back from the record onto the photo detector, the improvements characterized by:

a. means for extracting the low frequency and d.c. components from the photo detector output signal, said extracted

components being proportional to the average light intensity incident on the photo detector,

b. means for comparing the extracted components with a reference voltage to derive an error signal, and



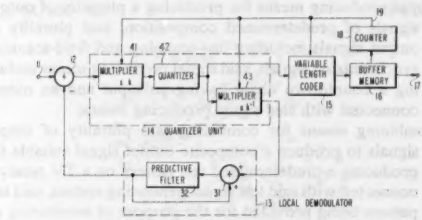
c. means for regulating the intensity of the source of laser light in response to the error signal, to thereby maintain the light intensity on the photo detector substantially constant.

4,093,962

ADAPTIVE PREDICTIVE ENCODER

Tatsuo Ishiguro, and Norio Suzuki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1976, Ser. No. 746,558
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—138 **3 Claims**



1. In a predictive encoder having means responsive to an input signal for producing a predictive error signal, quantizer means responsive to said predictive error signal for producing information codes, means for converting said information codes into variable length codes, a buffer memory for temporarily storing said variable length codes for transmission at a predetermined bit rate, and means operatively coupled to said buffer memory for producing a buffer status signal indicative of buffer occupancy of said buffer memory, wherein the improvement comprises: said quantizer means comprising control means for varying in response to said buffer status signal the amplitude of said predictive error signal relative to quantization levels of said quantizer means.

4,093,963

HORIZONTAL AFC CIRCUIT IN A TELEVISION RECEIVER USABLE WITH A VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Tomoaki Uchida, Iwai, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed Jun. 10, 1976, Ser. No. 694,795
Claims priority, application Japan, Jun. 19, 1975, 50-73781
Int. Cl.[2] H04N *5/04;* H03K *5/20;* H03F *3/68*
U.S. Cl. 358—158 **3 Claims**

1. A horizontal AFC circuit comprising:

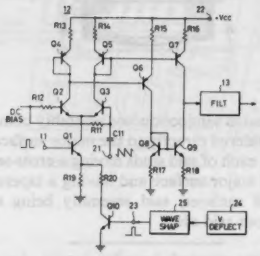
phase detector means supplied with a horizontal synchronizing signal separated from a television video signal and with a comparison signal and carrying out phase comparison, said phase detector means having a transistor supplied at the base thereof with the horizontal synchronizing signal;

filter means for filtering the output of said phase detector means;

horizontal oscillator means supplied with the output of said filter means for oscillating with an oscillation frequency controlled thereby;

horizontal deflection means for forming the output signal of said oscillator means into a horizontal deflection pulse;

wave shaping circuit means responsive to the output pulse of said horizontal deflection means for wave-shaping said output pulse and for supplying the resulting output signal



thereof as said comparison signal to said phase detector means;

means for supplying a control pulse having a pulse width corresponding to a vertical blanking period of the television video signal; and

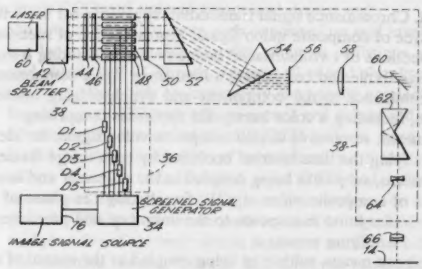
loop gain control means connected to the emitter of said transistor of said phase detector means in a manner to vary the emitter resistance in accordance with said control pulse, the collector current of said transistor being varied by the resulting variation of the emitter resistance thereof, whereby a DC loop gain and an AC loop gain of the horizontal AFC circuit are simultaneously controlled to be relatively large during occurrence of said control pulse and to be relatively small in a period other than the occurrence of said control pulse.

4,093,964

IMAGE REPRODUCING SYSTEMS

John E. Aughton, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Mar. 1, 1977, Ser. No. 773,211
Claims priority, application United Kingdom, Mar. 3, 1976, 8519/76
Int. Cl.[2] H04N *1/46*
U.S. Cl. 358—302 **4 Claims**



1. A half-tone image recording system comprising: means for generating a number of separate parallel beams of radiation

which, in cross section, form a line of spaced beams; a support for a recording surface to be treated by exposure to the beams of radiation; means producing relative movement of the recording surface on the one hand and the beams on the other hand, whereby the recording surface is scanned by the beams; modulating means for individually modulating the beams incident at points on the recording surface as required by the image to be reproduced and by the screen density variations required to produce a half-tone image, the modulation being such that some or all of the modulated beams contribute towards the recording of a single half-tone dot; and an optical system for guiding the modulated beams to the recording surface, the optical system including anamorphic means for compressing the line of beams in the direction of the line.

4,093,965

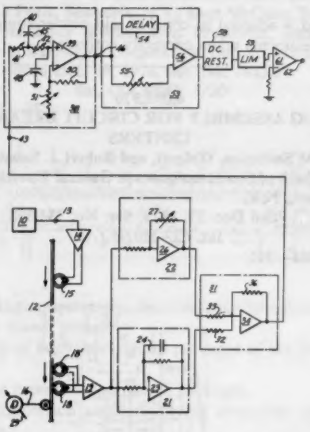
SPEED-SWITCHABLE READBACK SIGNAL EQUALIZATION AND DIRECT-CURRENT RESTORATION

David B. Gish, Upland, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,926

Int. Cl.² G11B 5/45

U.S. Cl. 360—65 **15 Claims**



1. In apparatus for recovering signals read back from a recording medium at different relative recording medium speeds, the improvement comprising in combination:

speed-switchable means for equalizing readback signals over frequency bands having different peak-to-bandedge roll-off regions for different relative recording medium speeds; and

high-frequency equalization means in said speed-switchable means for equalizing readback signals in said peak-to-bandedge roll-off regions, including active low-pass filter means for providing speed-switchable frequency peaking characteristics and speed-switchable cut-off frequency characteristics and for shifting said frequency peaking characteristics and cut-off frequency characteristics in company with each other to said different peak-to-bandedge roll-off regions for different relative recording medium speeds;

said active low-pass filter means including operational amplifier means having input means and output means, a speed-switchable RC network connected to said input and output means, and series-connected first and speed-switchable second resistor means, said first resistor means being connected between said input and output means, and said second resistor means being connected between said input means and a reference potential, with the ratio of the resistance, R_1, of said first resistor means to the resistance, R_2, of said second resistor means being such that R_1/R_2 plus one is at least two; and

said speed-switchable means including means for switching said speed-switchable RC network and second resistor means.

4,093,966

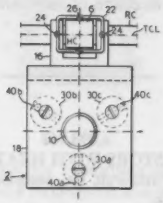
ADJUSTABLE HOLDER PARTICULARLY USEFUL FOR MOUNTING MAGNETIC HEADS

Dennis G. Hall, Wallington, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 29, 1977, Ser. No. 792,380

Int. Cl.² G11B 5/56

U.S. Cl. 360—109 **11 Claims**



1. An adjustable holder for a device permitting its adjustment for centering and skew with respect to a reference line, comprising: a supporting member for supporting the device; a mounting member; attaching means attaching the supporting member to the mounting member while permitting relative displacement therebetween; both said supporting member and said mounting member including first, second, and third mutually-engaging coupling elements having axes located to define the corners of a triangle having at least two equal sides, and a centerline passing through the axis of the first coupling element and mid-way between the axes of the second and third coupling elements; the two triangles defined by the coupling element axes of said supporting member and said mounting member being similar, non-congruent triangles having common center-lines; the coupling elements of one member being fixed and the coupling elements of the other member being rotatable about their respective axes and engaging the fixed coupling elements to effect a relative displacement between said supporting member and said mounting member; said rotatable coupling elements having means constraining the relative displacement of the engaging fixed coupling elements to rectilinear paths, with the displacement path of the first coupling elements being substantially parallel to the common center-line of the two triangles, and the displacement paths of the second and third coupling elements being at substantially equal angles to said common center-lines; said second and third mutually-engaging coupling elements being positioned between said first mutually-engaging coupling element and the device to be adjusted; whereby rotating the first rotatable coupling element effects skew adjustment of the device with respect to the reference line, and rotating the second and third rotatable coupling elements in equal and opposite directions effects centering adjustment of the device with respect to the reference line.

4,093,967

MAGNETIC TAPE CASSETTE

Takateru Satou, and Haruo Shiba, both of Saku, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 686,825

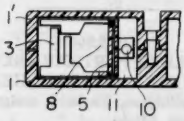
Claims priority, application Japan, May 16, 1975, 50-65512[U]

Int. Cl.² G11B 23/08, 15/60

U.S. Cl. 360—132 **4 Claims**

1. In a cassette carrying a record medium, a unitary pressure pad assembly for placing said record medium into sliding

contact with a magnetic head, said unitary pressure pad assembly including pin means for positioning the record medium and pressure pad means for urging the record medium against said magnetic head, the improvement wherein said cassette includes



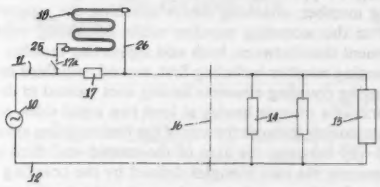
support means for retaining said unitary pressure pad assembly in place while allowing pivotal movement about an axis parallel to the longitudinal direction of movement of the record medium.

4,093,968

RESISTORS WITH HEAT SINK

Robert D. Shirey, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 22, 1976, Ser. No. 744,190
Int. Cl.[2] H02H 7/22
U.S. Cl. 361—58 **9 Claims**



1. A current limiter, comprising:

a continuous length of tubing, formed of a metal which is resistive to the flow of electrical current therethrough, opposite ends of said tubing being adapted for electrical connection in a line of an electrical system for limiting current flow therein,

and non-conducting material of high specific heat in heat transfer relationship with the interior surface of said tubing,

said material being adapted to absorb heat generated by the resistance to current flow in said tubing.

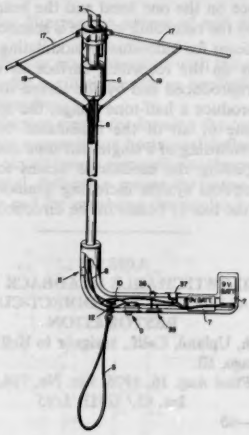
4,093,969

ELECTRIC UMBRELLA

Morris Maynor, Jr., P.O. Box 368, Atlanta, Tex. 75551

Filed Oct. 28, 1976, Ser. No. 736,347
Int. Cl.[2] H05C 1/06
U.S. Cl. 361—232 **11 Claims**

1. In a conventional umbrella to be used as a high powered electric shocking device, including a handle, a stem, a plurality of staves or ribs, a source of electric power, a voltage amplifier, a switch and spaced contact shocking elements incorporated therein; said handle is attached to one end of said stem while said plurality of ribs are commonly connected to the other end of said stem, said spaced contact shocking elements are attached to said other end of said stem and alternate ribs of said plurality of ribs are electrically connected to said shocking elements; in addition, said source of power and said voltage amplifier are placed within the confines of said handle and are connected to each other; said switch is also placed in said



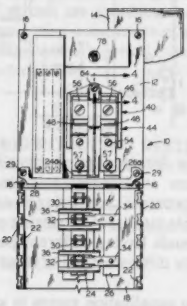
handle and is adapted to connect said power source and said shocking elements when correctly activated.

4,093,970

MAIN LUG ASSEMBLY FOR CIRCUIT BREAKER LOAD CENTERS

Andre J. M'Sadoques, Wolcott, and Robert J. Sabatella, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,553
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—361 **2 Claims**



1. A load center comprising, in combination:

A. an enclosure;

B. a pair of spaced, side-by-side, elongated busbars disposed within said enclosure;

C. a series of stab connectors affixed to said busbars at locations distributed along the lengths thereof, said stab connectors individually adapted to accept plug-on electrical connection with a branch circuit breaker;

D. an insulator secured to said enclosure and having openings through which said busbars extend to present therebeyond busbar terminal end portions;

E. a main lug assembly including

1. an insulative mounting block secured to said enclosure,

2. means forming a pair of recesses in said block,

3. a separate conductive strap accommodated in each said recess and affixed to said block,

4. a wire lug affixed to one end portion of each said strap; and
5. means notching said mounting block to expose the other end portion of each said strap as a terminal end portion disposed in lapped relation with an associated one of said busbar terminal end portions, and
6. an insulative barrier wall upstanding from said mounting block intermediate said recesses and extending coextensively with said straps as accommodated therein, said barrier wall rising to a level well above said straps and said wire lugs; and

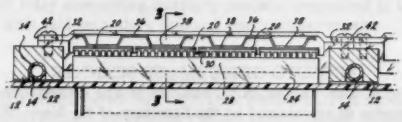
F. means formed in said terminal end portions of lapped busbars and straps for accepting threaded fasteneres pursuant to perfecting bolted joints therebetween.

4,093,971

D-I-P ON ISLAND

Bing-Lun Chu; Wunnava Venkata Subbarao, both of Piscataway, N.J.; Jack Peale, Scarsdale, N.Y.; Kent McCune, Belle Mead, and Marvin Elroy Steiner, East Brunswick, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 10, 1976, Ser. No. 748,837
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—382 **6 Claims**



1. A packaging system for electronic equipment comprising at least one island, including:

a plurality of integrated circuit packages of the dual-in-line type,

connector means mounting said packages,

an interconnection medium having electrical conductors thereon,

each of the connector means having a plurality of electrical contacts and operatively connected in a predetermined relationship to said interconnection medium and providing respective electrical paths between said integrated circuit packages and said interconnection medium conductors,

a cooling frame fastened to said interconnection medium configured such that a plurality of sections of thermally conductive material are situated in parallel, spaced apart relationship across the surface of said interconnection medium and containing fluid conduit means for carrying cooling fluid therethrough,

each of said connector means and packages being located in the space between an adjacent pair of said cooling frame sections, but out of engagement with said frame sections,

a cold bar disposed transversely of said frame sections and below the top of said frame sections with means on said bar attached to the top of said frame sections so that said means engages said frame sections in thermal conductive relationship, and

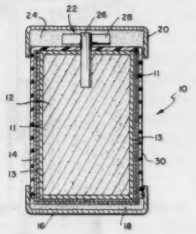
clamping means urging said packages into thermal contact with said cold bar whereby heat generated by said packages is transferred to said cold bar and to the ends of said bar for transfer to said frame sections.

4,093,972

ANODE TERMINATION MEANS FOR AN ELECTRICAL DEVICE COMPONENT

Gerald A. Voyles, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 639,371, Dec. 10, 1975, abandoned.
This application May 5, 1977, Ser. No. 794,299
Int. Cl.[2] H01G *9/00;* **H01L** *23/28*
U.S. Cl. 361—433 **11 Claims**



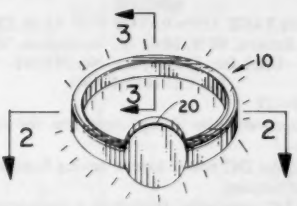
1. A chip type capacitor comprising at least two sides of opposite polarities and a termination means wherein the termination means includes a riser means in electrical contact with at least one of the sides, an elongated metal containing member joined to the riser means, and a metal containing end cap over the riser means having electrically conductive adhesive material therebetween whereby the metal containing end cap is electrically and mechanically coupled to the elongated metal containing member.

4,093,973

ILLUMINATED COSTUME JEWELRY

Ronald Vaagenes, 43429 Proctor Rd., Canton, Mich. 48188

Filed Jun. 22, 1976, Ser. No. 698,290
Int. Cl.[2] F21L *15/08*
U.S. Cl. 362—104 **8 Claims**



1. Costume jewelry comprising:

(a) a transparent body;

(b) means within said body for imparting color thereto at least when illuminated;

(c) illuminating means within said body for causing said body to glow with the desired color;

(d) a battery mounted within said body for energizing said illuminating means;

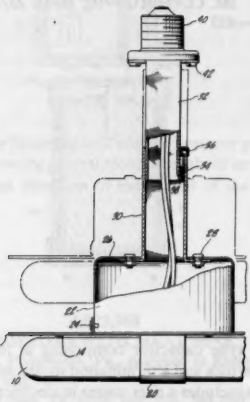
(e) switching means coupled to said battery and illuminating means; and

(f) wherein said transparent body has a hollow core and said core containing said color imparting means.

4,093,974
FLORESCENT LIGHT FIXTURE

Kenneth A. Wheeler, 6301 Glade, #315, Woodland Hills, Calif. 91364

Filed Oct. 1, 1976, Ser. No. 728,783
Int. Cl.[2] H05B 33/02
U.S. Cl. 362—216 4 Claims



1. A florescent light fixture for installation in a mounting for incandescent bulbs, comprising

a plug of capable of mating with a standard light socket for incandescent bulbs;

a transformer box;

a backing plate including a coupling for a florescent light, said backing plate being mounted to said transformer box; and

an extensible member including a first shaft and a second shaft, one of said shafts extending into the other of said shafts and being resistively extensible in an axial direction with respect thereto, said plug being mounted at a first end of said extensible member to one end of first shaft and said transformer box being mounted at a second end of said extensible member to one end of said second shaft, said first shaft being rigidly constrained from rotation relative to said second shaft.

4,093,975
HIGH-VOLTAGE APPARATUS FOR SKIN THERAPY

Wallace A. Roberts, 88 N. Main St., Bellingham, Mass. 02019

Filed Jan. 5, 1977, Ser. No. 757,041
Int. Cl.[2] H02M 5/44
U.S. Cl. 363—27 1 Claim

1. An improved high voltage apparatus for skin therapy comprising:

a low voltage DC power source having fixed and variable voltage outputs;

a DC-to-DC converter, having (i) a converter oscillator powered by the variable voltage output of the DC power source, (ii) a converter step-up transformer, the primary winding(s) of which are fed by the oscillator, (iii) a rectifier circuit connected to the secondary winding of the converter step-up transformer, and (iv) a filter capacitor in shunt across the rectifier output;

an output transformer;

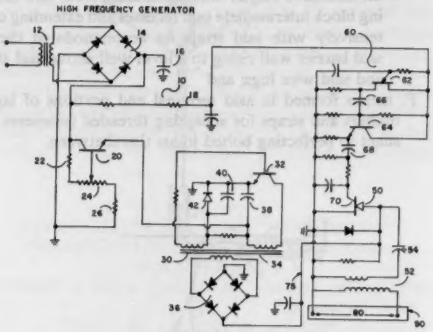
a second capacitor, connected in series with the output from the DC-to-DC converter and the primary winding of the output transformer;

a silicon-controlled rectifier, the anode and cathode of which are connected so as to cause discharge of the second capacitor across the primary winding of the output transformer whenever the silicon-controlled rectifier is triggered into conduction by a suitable pulse between its gate and source;

a second oscillator, powered by the fixed output of the DC power source;

an emitter-follower amplifier, also powered by the fixed output of the DC power source, the input of which amplifier is connected to the second oscillator and the output of which is connected to the gate of the silicon-controlled rectifier, so as to trigger the rectifier once per cycle of output of the second oscillator; and

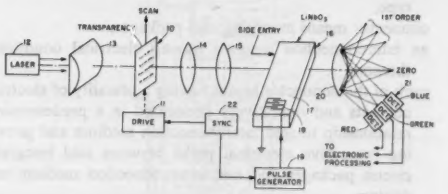
a skin therapy electrode connected to the secondary winding of the output transformer.



4,093,976
ACOUSTO-OPTIC IMAGE SCANNER

Pankaj K. Das, Cohoes, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1976, Ser. No. 717,974
Int. Cl.[2] H04N 9/10, 3/10; G02F 1/11; H04N 5/30
U.S. Cl. 358—53 10 Claims



1. A 1-D acousto-optic colored image scanner, comprising in combination

a piezoelectric crystal;

means for launching pulses of acoustic surface waves along a planar boundary surface of said crystal;

means for forming a colored image of the light distribution pattern which is to be scanned within said crystal, the light beam producing said colored image propagating within said crystal in a plane which is parallel and adjacent to said planar boundary surface such that said light beam and said pulses of acoustic surface wave interact with said pulses behaving as a traveling phase grating to diffract said light beam;

means for Fourier transforming the diffracted light emerging from said piezoelectric crystal; and

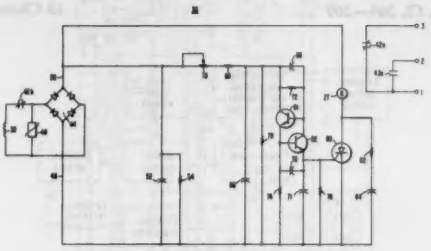
means for detecting the light appearing at the first-order diffracted image locations.

4,093,977

GROUND FAULT PROTECTIVE DEVICE

John T. Wilson, Brighton Township, Beaver County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1976, Ser. No. 696,326
Int. Cl.[2] H02H 3/28
U.S. Cl. 361—44 4 Claims



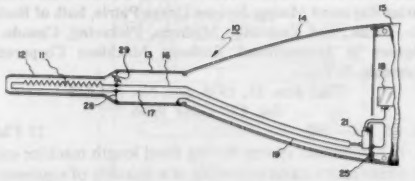
1. A self-powered ground fault protective device, comprising:
- a current transformer secondary coil;
- a latching relay comprising main contacts adapted to control an associated interrupting device;
- amplifying means connected to said coil for triggering said relay;
- rectifier means connected to said secondary coil for powering said amplifying means and said relay; and
- a housing supporting and enclosing said coil, said triggering means, and said relay;
- said relay comprising auxiliary contacts connected in series with said secondary coil and said rectifier means.

4,093,978

METHOD AND APPARATUS FOR PROTECTING ELECTRICAL SYSTEMS FROM LIGHTNING STRIKE EFFECTS

John A. Plumer, Jr., Dalton, Mass., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 554,127, Feb. 28, 1975, abandoned. This application Dec. 24, 1975, Ser. No. 644,340
Int. Cl.[2] H05F 3/00
U.S. Cl. 361—118 15 Claims



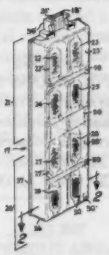
5. A lightning protection device adapted to be connected to an electrical system, said device comprising:
- first and second parallel wound, magnetically coupled inductors, each of said inductors having first and second terminals, said first terminals being the input terminals of said protection device;
- a third inductor having first and second terminals, said first terminal of said third inductor connected to said second terminal of said first inductor, said second terminals of said second and third inductors being the output terminals of said device; and
- a voltage limiting element connected to said first terminal of said third inductor and the second terminal of said second inductor, whereby a voltage or current surge applied to the input terminals of said protective device is reduced substantially at the output terminals.

4,093,979

MULTIPLE FLASH ARRAY

Norman E. Kewley, Pepper Pike, and Andrew Smetana, Mentor, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,615
Int. Cl.[2] G03B 15/02
U.S. Cl. 362—5 13 Claims



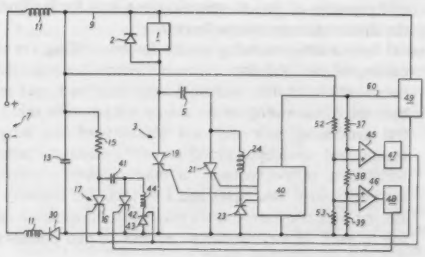
1. A flash lamp unit comprising first and second connector terminals for receiving lamp-firing electrical signals and arranged so that said first terminal is more readily touched than said second terminal when the array is handled by a person, said unit further comprising a flash lamp, an electrically conductive reflector positioned behind said lamp, first and second circuit conductors positioned behind said reflector, means connecting said first circuit conductor to said first connector terminals, and a radiation-actuated switch positioned behind said reflector and bridging across said circuit conductors, said reflector being provided with an opening in front of said radiation-actuated switch, the rear edge of said opening being contoured so as to bring said conductive reflector sufficiently near to only said first circuit conductor for causing electrostatic charges to pass between said first circuit conductor and said conductive reflector.

4,093,980

D.C. ELECTRICAL CIRCUIT MEANS

David Gurwicz, Gateshead, England, assignor to Sevcon Limited, Gateshead, England

Filed Apr. 4, 1977, Ser. No. 784,123
Claims priority, application United Kingdom, Apr. 8, 1976, 14212/76
Int. Cl.[2] H02M 1/14
U.S. Cl. 363—57 8 Claims



1. In electrical circuit means comprising a load, an SCR pulse controller connected in series with the load and including a commutation capacitor, a transmission line connected to the series path of the load and pulse controller to supply the load with energy from a D.C. source which during interpulse periods effects charging of the commutating capacitor, and a reservoir capacitor shunting the transmission line to limit the voltage to which the commutating capacitor is charged from

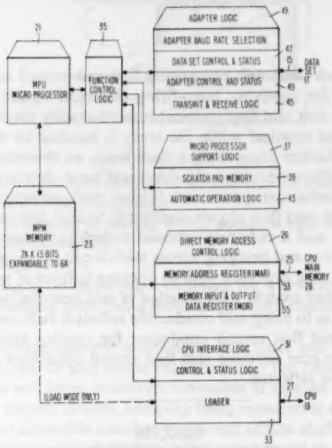
the D.C. source owing to inductance of the transmission line during interpulse periods, the improvement comprising control means for repeatedly discharging the reservoir capacitor during each interpulse period so as to limit the voltage to which during said interpulse periods the reservoir capacitor charges above the voltage of the source.

4,093,981

DATA COMMUNICATIONS PREPROCESSOR

John P. McAllister, Wayne, Pa.; Franklin Theodore Schroeder, Goleta, Calif., and Charles Terrance Stimson, West Chester, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 28, 1976, Ser. No. 653,087
Int. Cl.[2] G06F *13/00, 3/00*
U.S. Cl. 364—200 **2 Claims**



1. A data communications preprocessor for processing detailed line procedures between a central processing unit with a main memory and a plurality of data communications lines, each line therein connected to an individually associated data set, said data communications preprocessor comprising:

a plurality of line adapter means, each line adapter thereof individually associated with a data communications line in said plurality of data communications lines for facilitating the data communications therewith;

serial byte microprocessing means for controlling the processing of detailed data communications line procedures on an individual data communication line basis, said serial byte microprocessing means connected between said central processing unit and said plurality of line adapter means, said serial byte microprocessing means including a serial byte microprocessor, a micromemory means for storing control data bytes and a scratch pad memory for storing data communications parameter information relating to each data communications line in said plurality of data communications lines;

direct memory access means for permitting direct transfer of at least one byte of data between said main memory and said micromemory under the control of said serial byte microprocessor; and

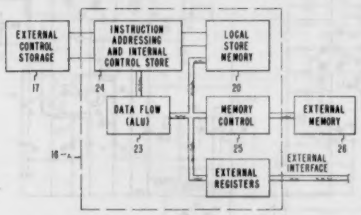
automatic operation means bypassing said serial byte microprocessor and utilizing said direct memory access means for automatically transferring through said direct memory access means at least one byte of data in parallel between said scratch pad memory and said main memory.

4,093,982

MICROPROCESSOR SYSTEM

Dale Arthur Heuer, Stewartville; Phillip Christian Schloss, and Larry Lloyd Schroeder, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1976, Ser. No. 682,803
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **13 Claims**



1. A data processing system including a processor on a single semiconductor chip wherein said processor comprises

a central processing unit;

on-chip control storage;

a plurality of input-output registers;

local scratch pad memory;

memory addressing means for addressing off-chip data store memory;

control storage addressing means; and data path means connecting said central processing unit with said control storage addressing means, said local scratch pad memory and said plurality of input-output registers;

said processing system further comprising an external data store memory connected to at least one of said input-output registers and said memory addressing means and;

supplemental off-chip control storage addressable by said control storage addressing means.

4,093,983

FAST AND NORMAL RATE INSTRUCTION FETCHING

Charles Raymond Masog; Jerome Urban Petrie, both of Rochester, Minn., and Yasutsugu Mishima, Pickering, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1976, Ser. No. 696,446
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—200 **11 Claims**

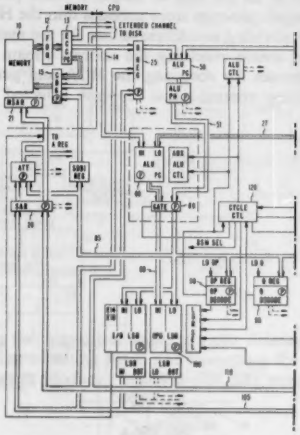
1. In a computer system having fixed length machine cycles and where instructions consisting of a plurality of segments are fetched from storage in a timed relationship to said fixed length machine cycles by fetching segments of an instruction successively to completely fetch an instruction, said instruction including first and second predetermined types of instructions, the improvement comprising:

means for fetching a first segment of an instruction during a first portion of said fixed length machine cycle to enable determination of the type of instruction being fetched,

instruction analyzing means for analyzing said first segment and generating one type of signal when the type of instruction being fetched is analyzed as being said first predetermined type of instruction and generating another type of signal when the type of instruction being fetched is analyzed as being said second predetermined type of instruction, and

means responsive to said instruction analyzing means gener-

ating said one type of signal for fetching at least another segment of said instruction during the same fixed length



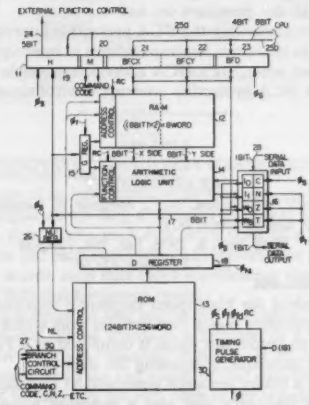
machine cycle that was used for fetching said first segment.

4,093,984

DATA PROCESSING SYSTEM HAVING A CYCLE CONTROL FUNCTION

Masahiko Ono, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 30, 1976, Ser. No. 728,204
Claims priority, application Japan, Sep. 30, 1975, 50-117906
Int. Cl.² G06F *1/04*
U.S. Cl. 364—200 **3 Claims**



1. A data procesing system for processing data arithmetically and transferring the processed data between an input-/output unit and a central processing unit, the data processing system having a cycle control function and comprising:

a register file consisting of registers each to be addressed and being adapted to store transfer data and the results of an arithmetic logic operation;

an arithmetic logic unit for arithmetically processing particular data read out from the register file;

memory means for storing instruction words;

instruction register means for storing an instruction word read out from the memory means during each machine cycle to designate an arithmetic logic operation to be carried out by the arithmetic logic unit;

at least one functional register addressed in the registr file and connected to the instruction register means to designate an arithmetic logic operation to be carried out by the arithmetic logic unit; and

signal generating means for generating a pulse representing the timing at which data are to be stored in each register addressed in the register file and a signal representing one of at least two partial cycles forming the machine cycle,

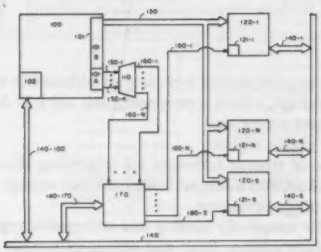
whereby during one partial cycle an arithmetic logic operation is carried out based on the contents of the functional register means in response to a signal which represents the partial cycle and during the other partial cycle an arithmetic logic operation is carried out based on instruction register means in response to a signal which represents the other partial cycle.

4,093,985

MEMORY SPARING ARRANGEMENT

Santanu Das, Stamford, Conn., assignor to North Electric Company, Galion, Ohio

Filed Nov. 5, 1976, Ser. No. 739,356
Int. Cl.² G06F *11/00, 13/00*
U.S. Cl. 364—200 **4 Claims**



3. A digital processor system comprising;

memory means including an integral number, N, of on-line memory modules and one spare memory module, each of the N+1 modules having module enabling means and a plurality of individually addressable words,

a central processor unit (CPU), an address bus and a data bus, both interconnecting the CPU with each of the N+1 modules,

a decoder having a plurality of inputs coupled to the CPU, and N outputs, the decoder being operative to convert binary coded information presented to the decoder inputs to a 1-of-N code at the decoder outputs, and

substitution control means having a first plurality of N inputs respectively coupled to the N decoder outputs, a second plurality of inputs coupled to the CPU, and N+1 outputs respectively coupled to corresponding module enabling means of the N+1 memory modules,

the CPU including means for generating and coupling to the decoder inputs a first portion of a binary coded memory word address designating a particular memory module, means for generating and coupling to the address bus a second portion of a binary coded memory word address designating a particular memory word within a module, means for receiving from the data bus contents of a memory word specified by generated first and second address portions, error control means operative, in conjunction with said means for receiving, to detect any malfunctioning memory module and to generate data identifying a malfunctioning module for presentation to the second plurality of substitution control means inputs,

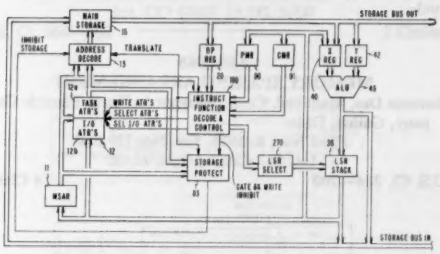
the substitution control means operative as connected to alter the 1-of-N code appearing at the decoder outputs to indicate instead the selection of the spare module when-

ever the 1-of-N code designates a malfunctioning on-line module previously identified at the second plurality of substitution control means inputs by the error control means of the CPU.

4,093,986
ADDRESS TRANSLATION WITH STORAGE PROTECTION

Ronald Eugene Bodner; Thomas Lee Crooks, and Richard Craig Kiscaden, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,392
Int. Cl.[2] G06F *13/00, 9/20*
U.S. Cl. 364—200 **12 Claims**



1. In a computer system including an addressable selectively operable storage, a central processing unit and I/O devices the improvement comprising

an addressable register,

a source of storage addresses for addressing storage and a special address distinguishable from said storage addresses for storage protection,

means for selectively loading said addressable register with a storage address from said source of storage addresses when said loaded storage address is to address an unprotected storage location or with said special address for storage protection,

means for generating an address translate control signal,

addressing means for addressing said storage and for selectively addressing said addressable register,

means selectively connectable under control of said address translate control signal to said addressable register for passing a storage address to said storage when said addressable register upon being addressed contains a storage address,

means selectively connectable to said addressable register under control of said address translate control signal for generating a storage inhibit signal when said addressable register upon being addressed by said addressing means contains said special address instead of a storage address, and

means for applying said storage inhibit signal to said storage.

4,093,987
HARDWARE CONTROL STORAGE AREA PROTECTION METHOD AND MEANS

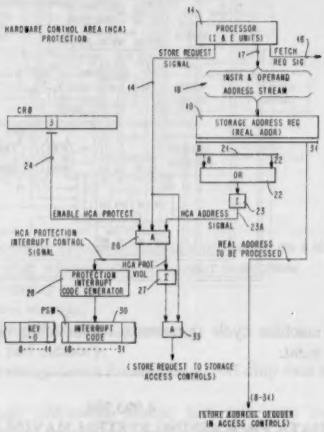
Charles Henry Gaudette, Yorktown Heights, and Raymond Charles Williams, Staatsburg, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,937
Int. Cl.[2] G06F *13/00, 9/18*
U.S. Cl. 364—200 **9 Claims**

1. A system for protecting a hardware control area (HCA) in main storage from being erroneously changed by execution of programs in other storage areas assigned to the same protection key as the HCA, in which the programs are segregated into segment windows permitted to store into the HCA, and all program segments outside the windows being prohibited from storing into the HCA, the system comprising

a HCA protection field in a system control register, the field being set to an on state to output a HCA protect state signal which prevents store accesses into the HCA,

means for providing an address stream for the main storage, detecting means receiving the address stream to detect real addresses for accessing the HCA and generating a HCA access control signal for each detected HCA address,



means for generating a store modify signal for each address making a store access request to the main storage,

first logic circuitry having inputs including: the HCA protect state signal, the HCA access control signal, and the store modify signal; an output of the first logic circuitry providing a HCA protection interrupt control signal when all the inputs are on, and

means for connecting the HCA protection interrupt control signal to processor interrupt circuits to interrupt a current program providing a HCA address responsible for generating a HCA protection interrupt control signal.

4,093,988
HIGH SPEED FREQUENCY RESPONSE MEASUREMENT

Paul F. Scott, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,628
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—484 **6 Claims**

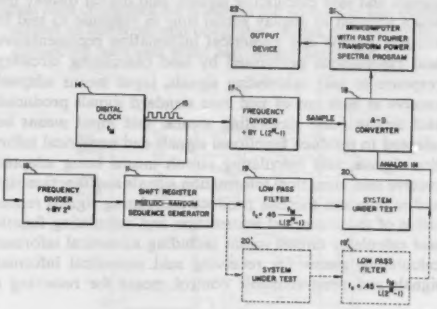
1. A method for high speed frequency response measurement by generating digital data samples from which the power spectra of an output test signal is computed by a Fast Fourier Transform technique, comprising the steps of

deriving a binary sequence generator bit shift signal having a first frequency and also a sampling actuating signal having a second frequency, said first and second frequencies being selected to synchronize and achieve a predetermined ratio between the sequence bit interval and the sampling interval of an output test signal,

supplying said bit shift signal to a binary sequence generator and producing at the output thereof a binary periodic noise signal representing the binary pseudo-random sequence with a period given by $(2^N-1)\Delta T_{seq}$, where N is an integer and ΔT_{seq} is the sequence bit interval equal to the reciprocal of the first frequency,

low pass filtering the binary periodic noise signal to retain frequency components having a substantially equal amplitude,

applying the filtered binary periodic noise signal to a system under test to generate the output test signal, and



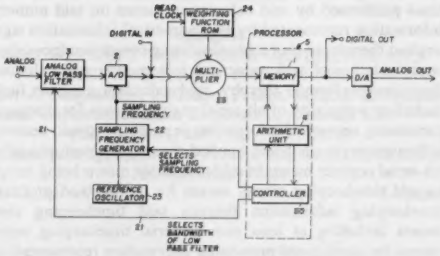
sampling the output test signal at a rate determined by said sampling actuating signal and converting the analog data samples so produced to said digital data samples.

4,093,989

SPECTRUM ANALYZER USING DIGITAL FILTERS

Joseph H. Flink, Monsey, and John Bertrand, Valley Cottage, both of N.Y., assignors to Rockland Systems Corporation, West Nyack, N.Y.

Filed Dec. 3, 1976, Ser. No. 747,053
Int. Cl.[2] G06F *15/34*; G01R *23/16*
U.S. Cl. 364—485 **18 Claims**



1. Spectrum analyzer comprising:

(a) a source of an input signal to be spectrum analyzed, said input signal comprising a plurality of digital input information data blocks, each data block being of a given time duration and each comprising a predetermined number of digital words, each data block representing signal energy with a different frequency range;

(b) means coupled to said source for weighting respective ones of said digital words as a function of a weighting function having a "smooth" function at its end points corresponding to the end points of said data blocks;

(c) means for digitally filtering each of the weighted digital data blocks with a digital filtering means having at least one center frequency falling within the frequency range represented by each of said data blocks, each of the data blocks comprising N samples satisfying the following equation:

$$N > Kf_o/B_n$$

where K is a constant which is a function of the sampling rate and the falloff rate of the skirt of filter characteristics, B_n is the filter bandwidth and f_o is the center frequency of the filter; and

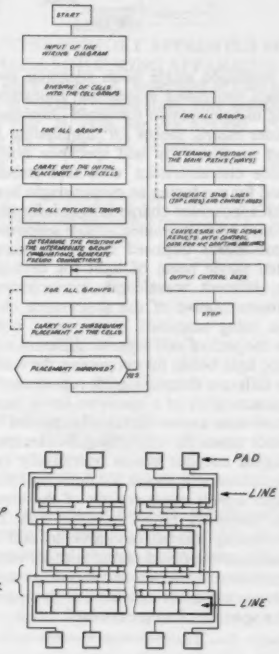
(d) means for effectively changing the bandpass frequencies of said digital filter means during spectrum analysis of said digital information data blocks of said input signal.

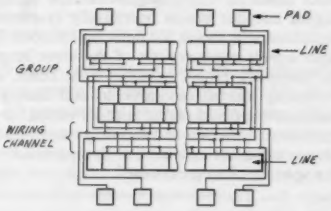
4,093,990

METHOD FOR THE PRODUCTION OF MASK PATTERNS FOR INTEGRATED SEMICONDUCTOR CIRCUITS

Konrad Koller, and Ulrich Lauther, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 22, 1975, Ser. No. 615,357
Claims priority, application Germany, Sep. 23, 1974, 2445368
Int. Cl.[2] G06F *15/20*; H05K *1/04*
U.S. Cl. 364—520 **6 Claims**


START
INPUT OF THE NETWORK DIAGRAM
DIVISION OF CELLS INTO THE CELL GROUPS
FOR ALL GROUPS
CARRY OUT THE INITIAL PLACEMENT OF THE CELLS
FOR ALL POTENTIAL TRUNKS
DETERMINING THE POSITION OF THE INTERMEDIATE GROUP CONNECTIONS, GENERATE PSEUDO CONNECTIONS
FOR ALL GROUPS
CARRY OUT SUBSEQUENT PLACEMENT OF THE CELLS
PLACEMENT IMPROVED?
YES
FOR ALL GROUPS
DETERMINE POSITION OF THE MAIN PATHS (WAYS)
GENERATE STUB LINES (ZIP LINES) AND CONNECTIONS
CONVERSION OF THE DESIGN RESULTS INTO CONTROL DATA FOR NC DRAFTING MACHINES
OUTPUT CONTROL DATA
STOP



1. A method for producing mask patterns for integrated semiconductor circuits, comprising:

dividing a plurality of standard cells into a predetermined number of cell groups of equal space requirements with as few as possible connections required between groups;

positioning each cell within its respective group to provide as few wiring levels as possible to obtain the paths of connection lines in co-ordinate terms;

converting the co-ordinate terms to numerical control data which may be used by a numerically-controlled drafting machine;

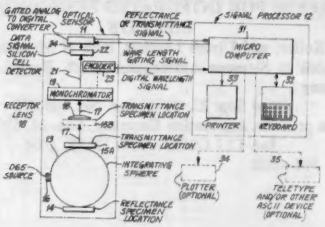
feeding the numerical control data to a numerically-controlled drafting machine; and

drawing a mask with the drafting machine in response to receipt of the control data.

4,093,991
SPECTROPHOTOMETER-DIGITAL DATA PROCESSING SYSTEM FOR APPEARANCE MEASUREMENTS PROVIDING FAST AND ACCURATE STANDARDIZATION, EASE OF USE FOR DIFFERENT APPEARANCE MEASUREMENTS AND FAST RESPONSE

John S. Christie, Jr., McLean; S. Upton Jenkins, Fairfax, and George B. McConnell, Vienna, all of Va., assignors to Hunter Associates Laboratory, Inc., Fairfax, Va.

Filed Jan. 26, 1977, Ser. No. 762,929
Int. Cl.[2] G01N *21/22;* G01J *3/02;* G06F *15/20*
U.S. Cl. 364—525 33 Claims



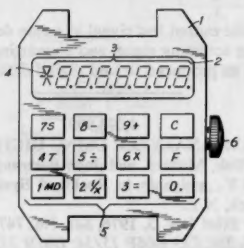
1. A combined single beam scanning spectrophotometer-digital data processing system for appearance measurements including in combination stabilized illumination means, specimen holder means, means for illuminating a specimen to be examined supported by said specimen holder means for its appearance characteristics with said stabilized illumination means and for producing an output single beam of light modulated with appearance characteristics information pertaining to the specimen being examined, visible spectrum scanning monochromator means disposed in said appearance information modulated single beam of light for deriving a plurality of separate different wavelength monochromatic single light beams representative of the appearance characteristics of a specimen being examined, electro-optic detector means disposed in the path of said separate different wave length monochromatic light beams for converting the same to a plurality of separate different electric signals representative of the appearance characteristics of a specimen being examined, analog to digital converter means electrically coupled to said electro-optic detector means for converting the electric signals to digital form, digital encoder means operatively synchronized with said monochromator means for deriving encoded digital electric output signals characteristic of the wave length of each different frequency monochromatic light beam, and digital data processing means responsive to said analog to digital converter means and said digital encoder means for processing said digital electric outputs and deriving output electric signals for display or other use indicative of the appearance characteristics of a specimen being examined.

4,093,992
ELECTRONIC WRISTWATCH

Yoshikazu Kawamura; Akio Shimoi, and Yuichiro Iwai, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 739,771
Claims priority, application Japan, Nov. 7, 1975, 50-133717
Int. Cl.[2] G06F *7/48, 15/02;* G04B *19/30*
U.S. Cl. 364—705 37 Claims

1. An electronic wristwatch comprising, in combination, timing pulse generating means for producing a plurality of time standard signals, timekeeping circuit means coupled to said timing pulse generating means for receiving at least one of said time standard signals, and in response thereto producing timekeeping signals representative of actual time, calculator circuit means coupled to said pulse generating means for receiving at least two of said time standard signals produced by said timing pulse generating means and in response thereto, producing calculating signals representative of calculations performed thereby, digital display means for receiving said timekeeping signals and said calculating signals, said digital display means being adapted to display actual time in response to said timekeeping signals and numerical information representative of said calculations performed by said calculating circuitry in response to said calculating signals, input means adapted to receive at least one of said time standard signals produced by said timing pulse generating means, said input means being adapted to produce functional signals and numerical information signals, said calculating circuit means being adapted to receive said numerical information signals and function signals and in response thereto, produce calculating signals representative of the numerical information and calculating functions, said calculator circuit means including numerical information calculating means for receiving said numerical information signals and programmable control means for receiving said



function signals and in rsponse thereto controlling the calculations performed by said calculating means on said numerical information represented by said numerical information signals applied thereto, so that said calculating means produces signals representative of said numerical information and calculating functions performed thereby, said calculating means further including a plurality of bit-serial register means for storing and processing numerical information in response to said numerical information signals being applied thereto, at least one of said bit-serial register means in said calculator means being coupled to said timekeeping circuit means for storing and processing timekeeping information therein, said timekeeping circuit means including at least one bit-serial timekeeping register means for storing and processing information representative of actual time, said timekeeping signal being a bit-serial signal, said calculator bit-serial register means being adapted to store and transfer said numerical information and calculating signals produced thereby in bit-serial form.

4,093,993
BIT-SLICE TYPE LARGE SCALE INTEGRATED CIRCUIT WITH MULTIPLE FUNCTIONS ON A ONE-CHIP SEMICONDUCTOR DEVICE

Kazuyuki Sato, Koganei, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Aug. 27, 1976, Ser. No. 718,400
Claims priority, application Japan, Aug. 28, 1975, 50-104239
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—712 5 Claims

1. A bit-slice type large scale integrated circuit formed on a one-chip semiconductor device comprising:

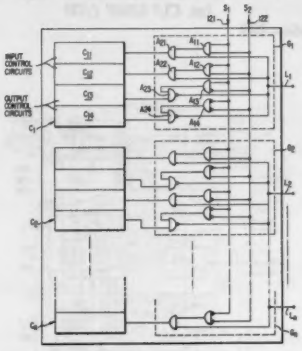
a plurality of bit-sliced input control circuits with different functions,

a plurality of bit-sliced output control circuits with different functions,

gate circuits including decoding gates and input and output gates, the output terminals of said decoding gates connected with input terminals of said input and output gates for enabling said input and output gates, the output termi-

nals of said input gates connected with said input control circuits and input terminals of said output gates connected with said output control circuits,

signal lines connected for common use with input and output signals to and from said integrated circuit, said signal lines connected with said input and output gates; and,



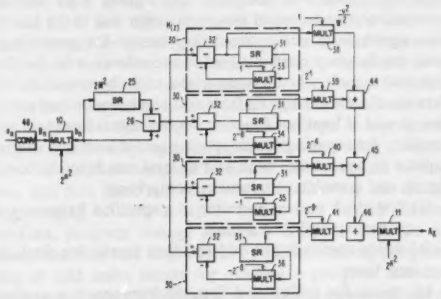
selecting lines connected with the input terminals of said decoding gates for supplying selecting signals thereto to cause said decoding gates to enable said input and output gates, whereby selected connections can be established between said input control circuits and said output control circuits and said signal lines through said input and output gates.

4,093,994

FAST DISCRETE TRANSFORM GENERATOR AND DIGITAL FILTER USING SAME

Henri J. Nussbaumer, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,212
Claims priority, application France, May 21, 1976, 76 16129
Int. Cl.² G06F *15/34*
U.S. Cl. 364—726 **5 Claims**



1. An improved generator of the terms of discrete transforms of the so-called Fourier transform family, particularly useful in digital filters and operating to generate a series of blocks of transform terms $[A_K]_{K=O}^{N-1}$ from a series of blocks of N digital samples $[a_n]_{n-O}^{N-1}$, where N is a square of an integer ($N=M^2$), said generator being of the type having an upstream weighting means for providing weighted sample a_n terms and a downstream weighting means for providing transformed terms A_K and having a filter bank comprising M filters placed between said upstream and downstream weighting means, and having adding means for adding the filtered outputs of individual orders of said M filters in said filter bank wherein said improvement comprises:

(a) subtracting means connected to the inputs of each order in said bank of filters for subtracting, term-by-term, from each weighted a_n term which is provided by said upstream weighting means, the said weighted a_n term which preceded it by 2N positions and,

(b) each of the orders of said filters of said bank includes,

an input terminal and an output terminal,

a recursive filtering means having an input and an output and having its input connected to said input terminal of its said order filter in said bank and

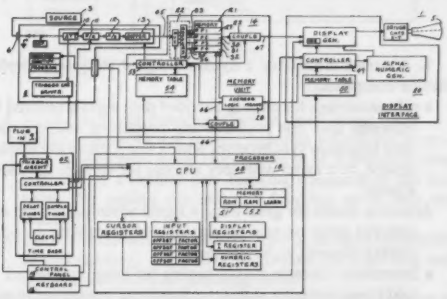
a constant coefficient weighting means having an input and output and, having its input connected to the output of the corresponding recursive filtering means of said M filter bank and its output, being the said output terminal for said order of said filter, being connected to said adder means for adding the output of said order of said filter to the outputs of the other said orders of said filters in said bank, the combined output of which is connected to said downstream weighting means.

4,093,995

RANDOM ACCESS MEMORY APPARATUS FOR A WAVEFORM MEASURING APPARATUS

Steven R. Smith, and Frederick A. Rose, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,890
Int. Cl.² G06F *3/14, 13/06, 3/05*
U.S. Cl. 364—900 **14 Claims**



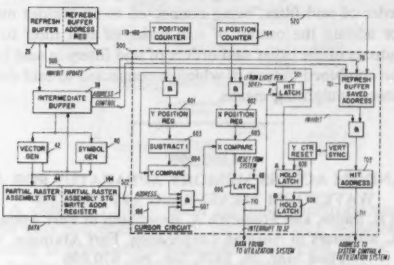
1. In a waveform measuring instrument, comprising a digital random access memory means having a plurality of addressable physical memory cell means, a waveform signal input means connected to said digital random access memory means to sample a waveform signal and digitizing said signal waveform samples into digital representation data and storing said digital representation data in said memory cell means, said random access memory means including a plurality of memory parts, each of said parts including a plurality of said physical memory cell means and an input port means for writing waveform data into said cell means, control means for selectively connecting said signal input means to said input port means and addressing the memory locations for continuously writing into the memory cell means of the parts connected to said input port means in a continuous cyclical writing sequence, said control means including first means for logically connecting said parts into a plurality of individual memory arrays and connecting one of said input port means for storing an independent waveform composite into one of the parts and second means to logically connect said parts into a composite array consisting of two or more of the parts, said composite array being capable of accepting independent waveform representation data in said cyclical sequence for storing an independent waveform composite into said composite array.

4,093,996

CURSOR FOR AN ON-THE-FLY DIGITAL TELEVISION DISPLAY HAVING AN INTERMEDIATE BUFFER AND A REFRESH BUFFER

Walter John Hogan, Fairfax, Va.; Alfred Alexander Schwartz, Leander, Tex., and Joseph Robert Stewart, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,543
Int. Cl.[2] G06F *3/14;* G06K *15/20*
U.S. Cl. 364—900 6 Claims



1. A cursor circuit for a dynamic digital television display device comprising:

a refresh storage for storing encoded data signals ordered by extremal scan line positions and outputting said encoded data signals in synchronism with a line scan of the display device, to a raster assembly storage for storage for video signals;

detection means for generating a signal when positioned at a selected point on said display device containing a coded display element to be accessed;

a coordinate storage means having an input connected to said raster assembly storage and an input connected to said detection means, for storing the "X" and "Y" coordinates of said display element upon receipt of a signal from said detection means; and

comparison means connected to said coordinate storage means and to said refresh storage, for comparing the "X" coordinate for each coded display element with the "X" coordinate value stored in said coordinate storage means during the loading of said video signals in said raster assembly storage for the raster line having a "Y" coordinate equal to the value stored in said coordinate storage means, to identify the coded display element to be accessed in said refresh storage;

said refresh storage including a refresh buffer having an output, connected to receive randomly occurring data signals and sort those signals into groups of ordered data signals ordered by extremal line scan position and also including an intermediate buffer having a first input connected to the output of said refresh buffer for storing said ordered data signals once during each display field and outputting said ordered data signals in synchronism with the line scan of the display device;

said coded display element to be accessed being identified in the intermediate buffer;

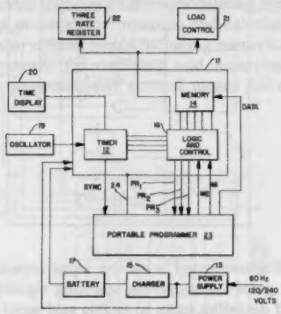
whereby the coded display element to be accessed is identified in said refresh storage.

4,093,997

PORTABLE PROGRAMMER FOR TIME-OF-DAY METERING REGISTER SYSTEM AND METHOD OF USING SAME

Warren R. Germer, Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Sep. 17, 1976, Ser. No. 724,040
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 12 Claims



1. A portable programmer for programming a multiple rate electrical energy meter of the type including a first mechanical register for continuously registering the consumption of electrical energy, at least one alternate mechanical register for registering the consumption of electrical energy during preselected time intervals, a sync signal generator for generating a sync signal, a controllable clock for generating signals normally representative of real time, a recirculating storage for storing time data signals representative of a plurality of predetermined times and for storing function data signals representative of control functions to be performed at said predetermined times, a comparator for periodically comparing the signals from said clock with the time data signals, logic circuitry responsive to an output of said comparator and to the function data signals from said recirculating storage for generating at least one function control signal in accordance with the function data signals when a comparison exists between said time data signals and the signals from said clock, and means responsive to said at least one function control signal from said logic circuitry for engaging or disengaging said at least one alternate register in accordance with said at least one function control signal, said portable programmer comprising:

(a) first clock means, operating at a specified frequency, for generating real time signals;

(b) means responsive to said real time signals for displaying real time;

(c) means for setting said first clock means to a predetermined real time;

(d) second clock means for generating high frequency clock signals, said second clock means being stepped by said sync signal from said multiple rate meter at a substantially greater frequency than the operating frequency of said first clock means;

(e) means for comparing the real time signals and the high frequency clock signals from said first and second clock means respectively; and

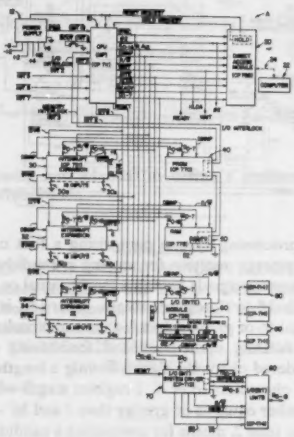
(f) means for inhibiting the operation of said controllable clock in said multiple rate meter when a comparison exists between said real time signals and said high frequency clock signals.

4,093,998

PROGRAMMING MODULE FOR PROGRAMMABLE CONTROLLER USING A MICROPROCESSOR

David D. Miller, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,785
Int. Cl.[2] G06F 9/00
U.S. Cl. 364—900 9 Claims



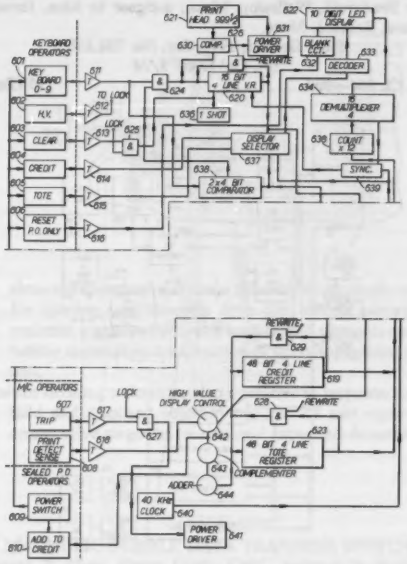
1. A programming module for programming a number of programmable read only memory units secured onto a single memory module for use at a selected location of several locations in a programmable controller using a microprocessor operated on a given logic voltage level and having output address lines, and input/output bi-directional data lines and having means for creating a read signal on a read line and a write signal on a write line, said units being programmable by data at data terminals on said memory units and at locations determined by an address on address terminals of said memory units only when receiving a program voltage at a programming terminal, said programming module comprising: an input side with terminals temporarily connectable with said address lines, said data lines, said read line and said write line during programming of said units; an output side having address terminals, program voltage terminals and data terminals for connection with said single memory module during programming of said units; means for creating a program initiation signal upon receipt of a command signal on a selected one of said address lines; latch means responsive to said initiation signal for latching data on said data terminals and an address in said address terminals; power means supported on said programming module for creating said program voltage, said program voltage being substantially higher than said given logic voltage level; decoding means for directing said program voltage to a selected one of said program voltage terminals, means for connecting said data terminals of said module to said data terminals of said units; means for connecting said address terminals of said module to said address terminals of said units; and, means for connecting each of said program voltage terminals to a programming terminal of one of said memory units.

4,093,999

ELECTRONIC FRANKING MACHINES

Paul Fuller, Romford; John Brian Gillender, Canvey Island; Michael Shacklady, Benfleet, and Samir Basu, Romford, all of England, assignors to Vickers Limited, London, England

Filed Dec. 1, 1976, Ser. No. 746,490
Int. Cl.[2] G06F 15/28, 3/12, 3/02
U.S. Cl. 364—900 28 Claims



1. In an electronic franking machine comprising:

franking value selection means, operable selectively to provide an electrical input representative of a franking value selected for a desired next franking operation of the machine, for setting the selected franking value into the machine;

a digital electronic input register, having an input connected to said franking value selection means, for receiving and holding said selected franking value;

an electrically adjustable printing device, settable electrically to any selected one of a plurality of different conditions enabling the device to be actuated respectively to print a plurality of different franking values;

setting control circuitry, connected with said input register and said printing device, operable in dependence upon said electrical input to bring about setting of said printing device to the condition in which it is actuable to print said selected franking value;

a digital electronic total register, for holding an accumulated value representative of the sum of the respective franking values used in preceding franking operations of the machine; and

totalling circuitry, connected between said input register and said total register, for effecting addition of said selected franking value held in the input register to said accumulated value; whereby a new accumulated value is provided, to be held in said total register, after printing of said selected franking value, in place of said accumulated value previously held there,

the improvement wherein said machine comprises an electronics unit which houses franking value selection means, said input register, said total register and said totalling circuitry and a separate printing unit which houses the said electrically adjustable printing device and with which said electronics unit is engaged during the operation of the

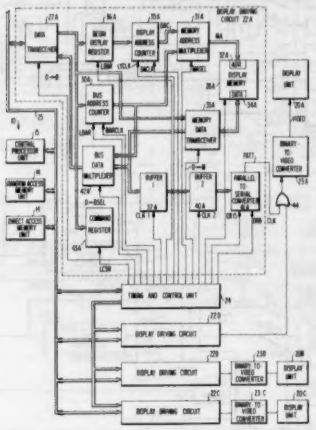
machine, said electronics and printing units being readily separable one from the other and having complementary coupling means for setting up operative electrical connections therebetween when the electronics unit is engaged with the printing unit.

4,094,000

GRAPHICS DISPLAY UNIT

Finn Brudevold, Wellesley, Mass., assignor to Atex, Incorporated, Bedford, Mass.

Filed Dec. 16, 1976, Ser. No. 751,138
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—900 **15 Claims**



1. A graphics display unit for providing a visual image that corresponds to input data, said graphics display comprising:

A. matrix display means have a plurality of energizable display positions at intersections on a matrix including a reference display position, individual display positions being selected for energization in a predetermined sequence.

B. memory means connected to said matrix display means, said memory means having a plurality of addressable storage locations for storing binary information that corresponds to the image to be displayed and that defines the energization level for each said display position of said matrix display means, said memory means storing the input data in a portion of said addressable storage locations;

C. addressing means connected to said memory means for generating storage location addresses for all said storage locations in said memory means in an addressing sequence;

D. initial address means connected to said addressing means for storing an initial address that establishes an initial correspondence between one of said storage locations and said reference display position;

E. altering means connected to said initial address means for altering said initial correspondence between said one addressable storage location and said reference display position by changing the initial address thereby to generate a new initial correspondence and relocate the image on said display means; and

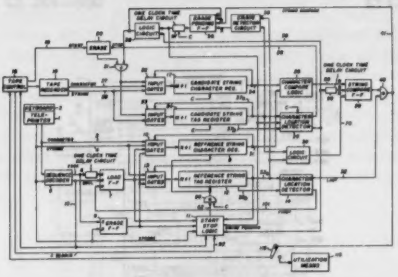
F. timing and control means connected to said addressing means and said matrix display means for maintaining a relative correspondence between the addressing of successive storage locations and the selection of successive display positions by synchronizing the predetermined sequence and the addressing sequence based upon the initial correspondence.

4,094,001

DIGITAL LOGIC CIRCUITS FOR COMPARING ORDERED CHARACTER STRINGS OF VARIABLE LENGTH

Donald E. Miller, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Mar. 23, 1977, Ser. No. 780,446
Int. Cl.[2] G06F *7/22*
U.S. Cl. 364—900 **17 Claims**



1. Data processing system comprising a first continuously circulating storage register for storing a candidate string of ordered character signals having a length equal or less than M characters in M + 1 register stages, where M is an integral number equal to or greater than 3, a second circulating storage register circulating upon command for storing a reference string of ordered character signals having a length equal to or less than N characters in N + 1 register stages where N is an integral number equal to or greater than 1 and M — N is equal to or greater than 2, means for comparing a candidate string of character signals stored in said first register with a reference string of character signals stored in said second register to indicate any identity of stored strings of character signals comprising first means for causing said stored strings of candidate and reference character signals to synchronously circulate in their respective registers, means for comparing said last named circulating strings of signals in character serial form to produce a first signal indicative of whether said strings of signals are identical or not, means for sensing that the number of character signals in said circulating candidate string of character signals is greater than the number in said circulated reference string of character signals to produce a second signal, second means responsive to said second signal and to said first signal for delaying circulation of reference character signals in said second register for a sufficient time to cause the relative positions of the candidate and reference character signals in the stages of their respective registers to be shifted by an integral number of stages greater than zero, means for causing said first means, said second means, said means for comparing and said means for sensing to repeatedly perform their function until a first output signal is produced indicative that the strings of signals are identical, and means for utilizing said last named output signal.

4,094,002

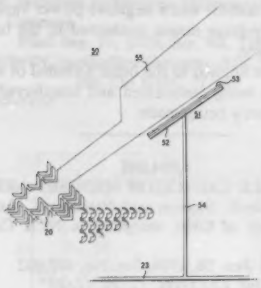
SACRIFICIAL ARC SUPPRESSORS IN MAGNETIC BUBBLE MEMORIES

Andrew Henry Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 21, 1977, Ser. No. 779,839
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—1 **7 Claims**

7. A magnetic bubble memory including a layer of magnetic material in which magnetic bubbles can be moved, said memory including first and second patterns of permalloy and elec-

trically conducting materials separated by an insulating layer, said first and second patterns including portions thereof in



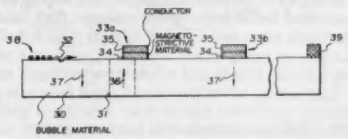
close proximity and adapted to define a preferential arcing position therebetween.

4,094,003

SONIC MAGNETIC DOMAIN SENSOR

Witold Kinsner, Hamilton, and Edward Della Torre, Toronto, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 29, 1976, Ser. No. 671,144
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—7 **12 Claims**



1. A device for sensing a magnetic bubble domain at a predetermined location in bubble supporting material comprising:

magnetostrictive means positioned with respect to said bubble supporting material to be magnetically influenced by the closure field of a bubble domain at said predetermined location;

conductor means in contact with said magnetostrictive means; and

sonic means for launching a sonic wave pulse which propagates past the vicinity of said magnetostrictive means in a predetermined direction for stressing said magnetostrictive means to rotate the magnetization of said magnetostrictive means when magnetically influenced by the closure field of a bubble domain, thereby inducing an electric signal in said conductor means to indicate the presence of the bubble domain.

4,094,004

GAPLESS MAGNETIC BUBBLE EXPANDER-DETECTOR CIRCUIT

Magid Yousri Dimyan, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,203
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **3 Claims**

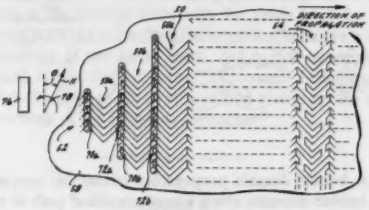
1. A bubble domain expansion and detector circuit for expanding and detecting magnetic bubbles moving along a predetermined path in a film of magnetic bubble material comprising:

a pattern of elements in an overlay of magnetic material positioned over a film of magnetic bubble material, and defining a bubble propagation path,

said elements being arranged in consecutive rows and defining consecutive stages for advancing domains therethrough in response to consecutive cycles of a magnetic field said rows of elements being without spaces in the direction of propagation,

said magnetic field being capable of magnetizing said elements,

each consecutive stage including a different number of said



elements to expand a domain moved therethrough, means for spacing said elements from the bubble material to maintain a gradient between each of said elements and the bubble material in the direction of said propagation paths and,

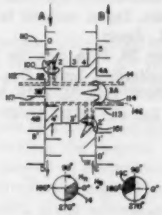
means defining a detector also operative in response to said field and disposed adjacent one end of said expanding consecutive stages to receive said expanded domains.

4,094,005

MAGNETIC BUBBLE DATA TRANSFER SWITCH

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 21, 1976, Ser. No. 688,651
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—16 **13 Claims**



1. An active data switch for magnetic bubble domain systems comprising:

first and second propagation paths;

each of said first and second propagation paths comprising a plurality of passive components;

first and second transfer switch means interposed between said first and second propagation paths;

said first and second transfer switch means forming portions of said first and second propagation paths,

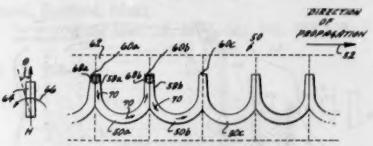
said first and second transfer switch means arranged such that the distance therebetween is different in said first and second propagation paths;

conductor means associated with said first and second transfer switch means to selectively control the operation of said first and second transfer switch means whereby said first and second propagation paths are selectively interconnected by at least one of said first and second transfer switch means during one operating cycle.

4,094,006
GAPLESS MAGNETIC BUBBLE PROPAGATION CIRCUIT

Magid Yousri Dimyan, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,206
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—39 3 Claims



1. A bubble domain propagating circuit for moving magnetic bubble domains along a predetermined path in a film of magnetic bubble material comprising:

a pattern of propagate elements in an overlay of magnetic material,

said magnetic material being positioned over a film of magnetic bubble material and said propagate elements defining the bubble propagation path for advancing said domains therethrough, in response to consecutive cycles of a magnetic field,

said magnetic field being rotated in the plane of said bubble material and being capable of magnetizing said elements,

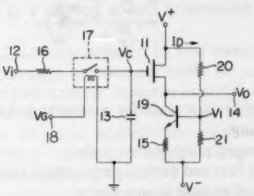
adjacent elements having ends which will have essentially the same polarity when subjected to said magnetic field in a direction perpendicular to said propagation path, and

means for spacing said propagate elements from the bubble material to maintain a gradient between each of the elements and the bubble material in the direction of said propagation path.

4,094,007
TEMPERATURE-COMPENSATED ANALOG VOLTAGE MEMORY DEVICE

Shunji Minami, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,226
Claims priority, application Japan, Dec. 4, 1975, 50-144871; Dec. 12, 1975, 50-148698; Dec. 26, 1975, 50-159391
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—45 8 Claims



1. A temperature-compensated analog voltage memory device comprising

(a) a MOS field-effect transistor,

(b) analog switching means having one terminal connected to the gate of said MOS field-effect transistor,

(c) a nonpolarized capacitor interconnected between the gate of said MOS field-effect transistor and ground, leakage of said capacitor being prevented by said MOS field-effect transistor and said capacitor,

(d) an NPN transistor having its collector connected to the source of said MOS field-effect transistor, said NPN transistor being used as a constant current source and to make constant drain current of said MOS field-effect transistor,

(e) an output resistor interconnected between the emitter of said NPN transistor and a negative power supply, and

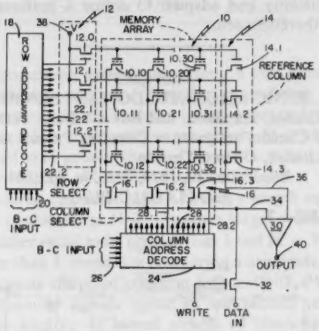
(f) a constant voltage means connected to the base of said NPN transistor,

whereby, an input applied to the other terminal of said analog switching means being memorized and transferred output, a non-volatile memory being made.

4,094,008
ALTERABLE CAPACITOR MEMORY ARRAY

George C. Lockwood, Dayton, and Nicholas E. Aneshansley, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 18, 1976, Ser. No. 697,602
Int. Cl.[2] G11C *11/24, 11/40*
U.S. Cl. 365—149 3 Claims



1. A non-volatile semiconductor memory system comprising:

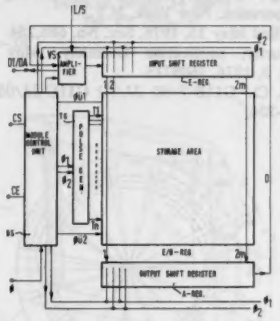
a rectangular array of non-volatile, alterable threshold capacitors disposed on a single semiconductor substrate and comprising a plurality of parallel source stripes formed in the substrate, and a plurality of non-volatile, alterable-threshold capacitor devices formed on said substrate in a plurality of columns each immediately adjacent one of said source stripes, each of said capacitor devices comprising dual gate insulator layers of thin silicon oxide and silicon nitride and a conductive gate element connected in common along each common gate row of said capacitor devices, and each of said capacitor devices being selectably preprogrammed to one of first and second threshold voltage states having associated first lower and second higher capacitance values by application of selected signals to substrate, source stripe and gate element; and

reading means comprising read signal means for applying a read voltage to a selected row of said capacitor devices, reference signal means for supplying a reference signal voltage, at least one differential sensing circuit receiving said reference signal voltage, and coupling means for operatively coupling said differential sensing circuit between a selected one of said source stripes and an output terminal, said read voltage having a magnitude at least equal to said second threshold voltage to couple a charge of first or second magnitude to said source stripe depending on whether the capacitor device associated with said selected row and selected source stripe is in said first or second threshold voltage state, said differential sensing circuit comparing the voltage induced on said selected source stripe by said charge with said reference voltage to produce an output of a first value if said induced voltage is greater than said reference voltage and a second value if said induced voltage is less than said reference voltage.

4,094,009
STORAGE ARRANGEMENT WITH MODULES CONSISTING OF CCD STORES

Peter Schneider, Poecking, and Ernst Goettler, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 21, 1976, Ser. No. 725,337
Claims priority, application Germany, Sep. 26, 1975, 2543023
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—183 **10 Claims**

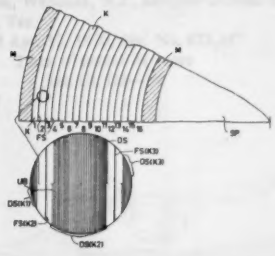


1. A storage arrangement suited for use with CCD stores comprising a CCD storage area having a series-parallel-series arrangement of data flow in which $2m$ parallel shift registers each of length n bits are arranged between an input shift register and an output shift register each being of length m bits; said $2m$ parallel shift registers being constructed with one storage electrode for each storage location using the electrode-per-bit principle; a circular pulse train shift register having a length of n storage locations with said n bits of said circular pulse train shift register each being connected to the gate termial of one of n switching transistors, each of said switching transistors having a first input connected to a supply potential and a second input connected to one of n pulse train lines of said storage area; a circulating charge in said circular shift register being the means whereby each one of said n switching transistors cyclically connects one of said n pulse train lines to said supply potential.

4,094,010
OPTICAL MULTI-CHANNEL DIGITAL DISC STORAGE SYSTEM

Rudiger Pepperl, Pinneberg; Johann Krüger, Quickborn, and Bernhard Hill, Hamburg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1976, Ser. No. 686,120
Claims priority, application Germany, May 21, 1975, 2522405
Int. Cl.[2] G11B *21/10, 7/00*
U.S. Cl. 365—215 **15 Claims**

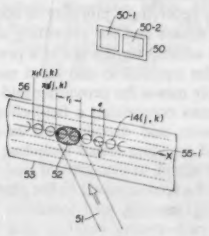


1. A system for the optical storage of information in a plurality of channels, comprising a rotating storage disc divided into a plurality of concentric channel areas, a plurality of concentric guide tracks on the disc, each guide track bordering one of the channel areas, a separate periodically interrupted spiral information track in each channel area on the disc, optical means for sequentially directing a separate control beam of radiation onto each guide track on said disc and for directing a separate information radiation beam onto each spiral information track, a first radial scanning system for substantially uniformly moving the information beam radially along said information track, a second radial scanning system responsive to the interaction of the control beam with the guide track for radially moving both the control and information beams to correct for eccentricity of the guide track, and means connected to said optical means for activating the control beam concurrently with the passage of the information beam into the interrupted portions of the information tracks.

4,094,011
SYSTEM FOR RECORDING AND REPRODUCING HOLOGRAM

Masao Nagao, Fuji, Japan, assignor to Asahi Kasai Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1976, Ser. No. 671,615
Claims priority, application Japan, Apr. 1, 1975, 50-38567; Aug. 29, 1975, 50-104135; Sep. 22, 1975, 50-113737
Int. Cl.[2] G11C *13/04*
U.S. Cl. 365—216 **20 Claims**



1. A method for recording information as Fourrier transform holograms which, in reproducing, are read out by relative, continuous scan with a reproducing light beam, comprising the steps of;

preparing information in a form adapted to be recorded as holograms by dividing the original information to be recorded into a number of information groups each consisting of a predetermined number, N, of unit-informations each consisting of a given amount of information, said predetermined number N being at least two,

supplying the prepared information to an information input device having a single or a plurality of unit-information input positions beginning from a first unit-information of a first group sequentially, said plurality of unit-information input positions being arranged on an information input surface without substantially overlapping one another,

exposing each unit-information supplied to said unit-information input position to an object light beam to effect modulation thereof, and

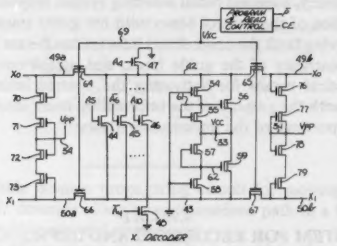
recording each unit-information as a hologram on a recording medium with a plurality of reference light beams one by one or a single reference light beam such that one-to-one different combinations of said single unit-information input position and said plurality of reference light beams or one-to-one different combinations of said plurality of unit-information input positions and said single reference light beam are used in sequence to record a series of holograms aligned on a track of the recording medium.

4,094,012

ELECTRICALLY PROGRAMMABLE MOS READ-ONLY MEMORY WITH ISOLATED DECODERS

George Perlegos, Santa Clara, and Phillip J. Salsbury, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 1, 1976, Ser. No. 728,789
Int. Cl.[2] G11C *11/40, 7/00*
U.S. Cl. 365—226 10 Claims



1. An electrically programmable MOS memory comprising:

a plurality of memory cells, said cells requiring a first potential for reading and a second potential, higher than said first potential, for programming;

input means;

output means, coupled to said plurality of memory cells;

decoding means comprising:

a decoder for receiving a plurality of address signals from said input means and for providing said first potential when said address signals are in a predetermined state, said decoder coupled to said input means;

voltage supply means for providing said second potential;

coupling means comprising a field-effect transistor coupled between said decoder and said voltage supply means, said coupling means including means for applying a first signal to the gate of said transistor during reading and a second signal to the gate of said transistor during programming, said transistor for providing an electrical path during reading, and for providing an electrical path during programming if said address signals are in other than said predetermined state;

said voltage supply means comprising a first and second depletion mode transistor coupled in series, said first transistor having its gate and one of its terminals coupled to said field-effect transistor of said coupling means and said second transistor having its gate and one of its terminals coupled to receive said second, higher potential;

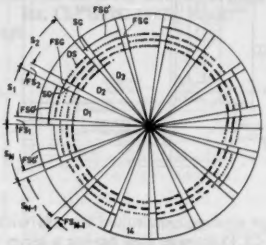
whereby said decoding means may be employed to select cells in said memory for reading and programming.

4,094,013

OPTICAL STORAGE DISK SYSTEM WITH DISK TRACK GUIDE SECTORS

Bernhard Hill, Hamburg; Rudiger Pepperl, Pinneberg, and Johann Krüger, Quickborn, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1976, Ser. No. 686,254
Claims priority, application Germany, May 22, 1975, 2522593; Mar. 3, 1976, 2608715
Int. Cl.[2] G11B *7/00, 21/10;* G11C *13/08*
U.S. Cl. 365—234 21 Claims

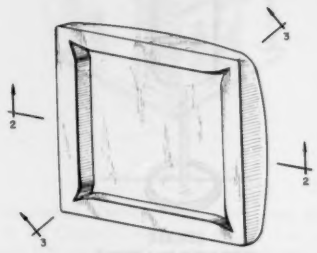


1. A storage disk for storing data in spiral or concentric tracks, comprising a disk-shaped storage medium having a recording surface divided into a plurality of equiangular guide sectors; each two of said data storage sectors being separated by a guide sector; said tracks thereby passing successively through data storage sectors and guide sectors; a data block of information being stored in substantially all of the track portions in each of said data storage sectors; guide segments being stored along the track in the guide sectors only adjacent alternate data blocks; the number of data storage sectors being odd to maintain the radial distance between edges of the guide segments substantially euqal to twice the radial distance between data blocks; blank segments being provided along the tracks in the guide sectors and adjacent further alternate data blocks, the tracks thereby containing repetitive successions of a data block, a guide segment, an additional data block and a blank segment.

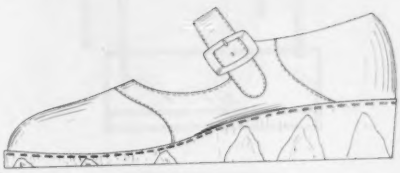
DESIGNS

JUNE 6, 1978

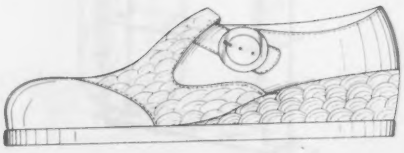
248,061
HAMBURGER ROLL
Albert C. Bangert, 162 Oak Manor Dr., York, Pa. 17403
Filed Jan. 8, 1976, Ser. No. 647,632
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—24



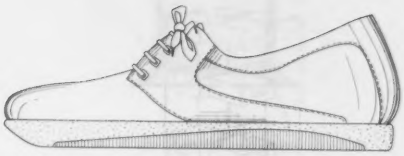
248,062
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,162
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—291



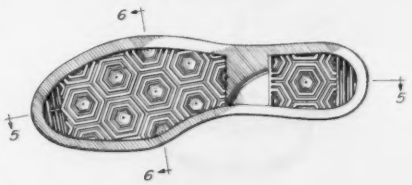
248,063
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,167
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—293



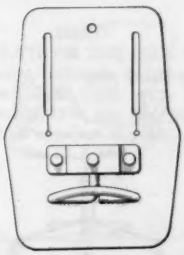
248,064
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,165
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—301



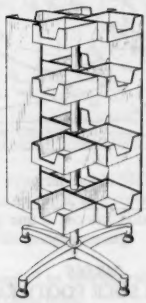
248,065
OUTER SOLE FOOTWEAR
Vijay Batra, 685 Oak St., Brockton, Mass. 02401
Filed Feb. 4, 1976, Ser. No. 655,090
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



248,066
TOOL HOLDER
George Hillinger, 5340 E. Harbor St., Commerce, Calif. 90260
Filed June 30, 1976, Ser. No. 701,429
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



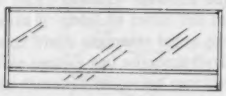
248,067
DISPLAY STAND
William S. Leath, Birmingham, Ala., assignor to Hanes Corporation, Winston-Salem, N.C.
Filed Mar. 21, 1977, Ser. No. 779,820
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—24



248,068
CHAIR
Hans Roericht, Neue Strasse 44, Ulm, Germany
Division of Ser. No. 633,593, Nov. 19, 1975. This application Apr. 18, 1977, Ser. No. 788,674
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

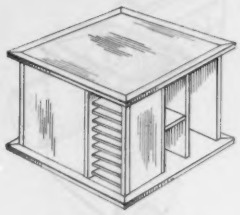
248,069
CONTAINER FOR TOILET TISSUE ROLLS OR THE LIKE
Gwendolyn Robles, 917 Sheridan Ave., Bronx, N.Y. 10451
Division of Ser. No. 561,781, Mar. 25, 1975, Pat. No. Des. 240,682. This application Jan. 28, 1976, Ser. No. 652,978
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

248,070
SHOPPING BAG HOLDER
Philip J. Catanzaro, and Lucy Ann Catanzaro, both of 3726 Lyndale Ave., Baltimore, Md. 21213
Filed Apr. 20, 1977, Ser. No. 789,204
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131



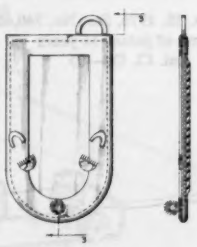
248,071
WINDOW SHELF FOR PLANTS
Earle G. Simmons, 25 Westchester Way, Warwick, R.I. 02886
Filed May 24, 1976, Ser. No. 689,519
Term of patent 14 years
Int. Cl. D6—*06, 04*
U.S. Cl. D6—137

248,072
CABINET
Robert H. Johnson, 701 Laurie Dr., Winthrop Harbor, Ill. 60096
Filed Apr. 26, 1976, Ser. No. 680,366
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—169

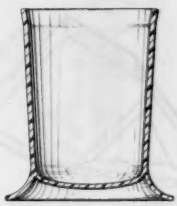


248,073
NESTABLE TABLE
Joseph P. Schneider, 3751 Poppy St., Long Beach, Calif. 90805
Filed Nov. 10, 1975, Ser. No. 630,181
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

248,074
JAR OPENER/POT HOLDER
Mary Randall, 214 Woodland Dr., East Islip, N.Y. 11730
Filed Jan. 7, 1976, Ser. No. 647,127
Term of patent 3½ years
Int. Cl. D6—*99*; D7—*99*
U.S. Cl. D6—293

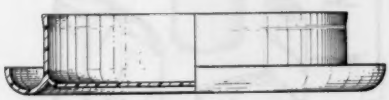


248,075
TUMBLER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Oct. 28, 1976, Ser. No. 736,678
Term of patent 14 years
Int. Cl. D7—*15, 01*
U.S. Cl. D7—11

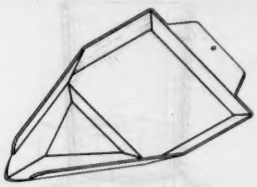


248,076
BOWL
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 30, 1976, Ser. No. 719,036
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—20

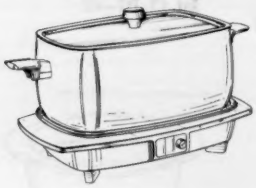
248,077
PLATE OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Oct. 28, 1976, Ser. No. 736,681
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23



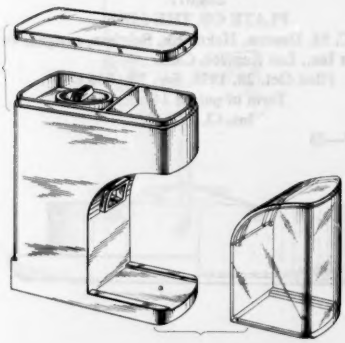
248,078
SORTING TRAY
Casper P. Warnekros, 1410 Clearview Rd., Santa Barbara, Calif. 93101
Filed Apr. 5, 1976, Ser. No. 673,935
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—37



248,079
ELECTRIC COOKING BASE AND VESSEL
David L. Painter, Glenview, Ill., and Norman C. Minsky, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 20, 1976, Ser. No. 724,436
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

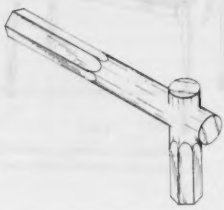


248,080
COFFEE MILL
Husazo Maejima, Tokyo, Japan, assignor to Sachie Ando, Tokyo, Japan
Filed Sep. 9, 1976, Ser. No. 722,056
Claims priority, application Japan, Jul. 7, 1976, 51-21070
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*
U.S. Cl. D7—155

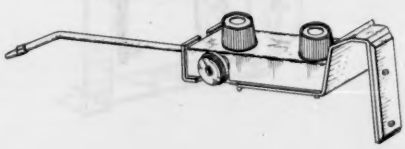


248,081
SQUEEGEE BUCKET
Barry Epstein, 3715 Rawnsdale Rd., Shaker Heights, Ohio 44122
Filed May 13, 1976, Ser. No. 686,078
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—187

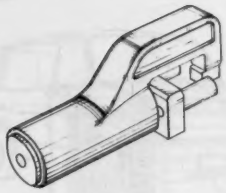
248,082
WRENCH
Floyd James Venable, Jr., Prairie Store, Prairie, Id. 83647
Filed Jul. 7, 1975, Ser. No. 593,617
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—29



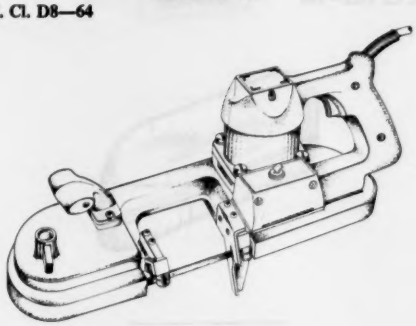
248,083
PORTABLE TORCH
Frank A. Zagara, Pittsford, and John M. Nelson, Rochester, both of N.Y., assignors to Bernzomatic Corporation, Rochester, N.Y.
Filed Nov. 10, 1976, Ser. No. 740,468
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



248,084
PULLER TOOL OR SIMILAR ARTICLE
Daniel A. Bruzek, Medford, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.
Filed Nov. 8, 1976, Ser. No. 739,599
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—61



248,085
PORTABLE BAND SAW
Charles R. Stelljes, Fayetteville; Lars Frostad, Syracuse, and Richard H. Chapman, Camillus, all of N.Y., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 515,111, Oct. 16, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,855
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—64



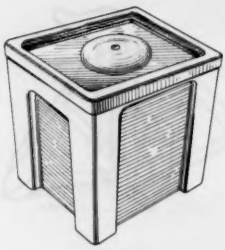
248,086
HIVE TOOL
William T. Maxant, Harvard Rd., P.O. Box 454, Ayer, Mass. 01432
Filed Aug. 6, 1976, Ser. No. 712,350
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

248,087
TIE-DOWN HOOK
Elwood Thomas Feldman, 8603 Delegge Rd., Baltimore, Md. 21237
Filed Mar. 8, 1976, Ser. No. 664,702
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—372

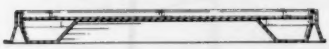
248,088
BOTTLE
William James Britt, Greenville, S.C., assignor to Morton-Norwich Products, Inc., Greenville, S.C.
Filed May 28, 1976, Ser. No. 691,062
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

248,089
CONTAINER FOR PILLS
James M. Phillips, 2310 Codding Dr., Modesto, Calif. 95350, and John A. Ormonde, 1016 Atlantic Dr., Modesto, Calif. 95351
Filed May 17, 1976, Ser. No. 686,722
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

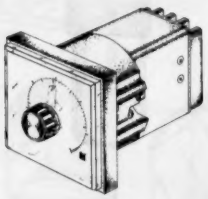
248,090
STORAGE CONTAINER FOR FOOD OR THE LIKE
Theodor Box, 1108 Aileen Rd., Brielle, N.J. 08730
Filed Apr. 7, 1976, Ser. No. 674,634
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237



248,091
CARTON COVER
Tom Frydendal, Oslo, Norway, assignor to Elopak A/S, Spikkestad, Norway
Filed Apr. 15, 1976, Ser. No. 677,368
Claims priority, application Norway, Oct. 22, 1975, 7557009
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—267

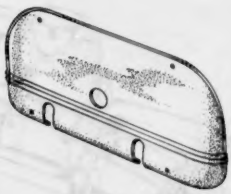


248,092
MOTOR TIMER
Teizo Fujita, and Toshiro Ohashi, both of Osaka, Japan, assignors to Izumi Denki Company Limited, Osaka, Japan
Filed Aug. 2, 1976, Ser. No. 711,083
Claims priority, application Japan, Apr. 5, 1976, 51-12570
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

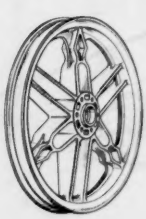


248,093
VAN
Charles W. Cancilier, Palatine, Ill., assignor to C. W. Cancilier Ltd.
Filed Aug. 4, 1977, Ser. No. 821,930
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99

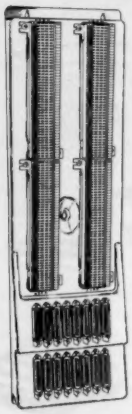
248,094
VEHICLE ROCK GUARD
Chalmer H. Nix, 1991 Austin Hwy., San Antonio, Tex. 78218
Filed Jun. 16, 1976, Ser. No. 696,481
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—190



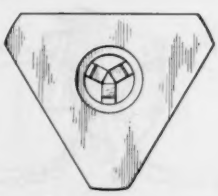
248,095
MOTOR-CYCLE WHEEL
Toshiyuki Shuzuki, Shimada, and Tadao Suzuki, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed May 18, 1977, Ser. No. 798,238
Claims priority, application Japan, Nov. 27, 1976, 51/46368
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



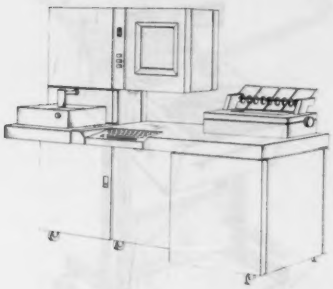
248,096
CONNECTOR PANEL
Lawrence J. Stupay, Endwell, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Mar. 31, 1976, Ser. No. 672,521
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



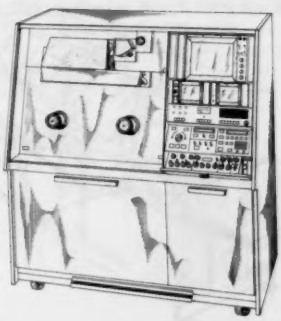
248,097
UNIVERSAL CONNECTOR BLOCK FOR FIBER OPTIC CABLES AND THE LIKE
Richard E. Feinbloom, New York, and Laszlo Endrodi, Jackson Heights, both of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Mar. 24, 1977, Ser. No. 780,961
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



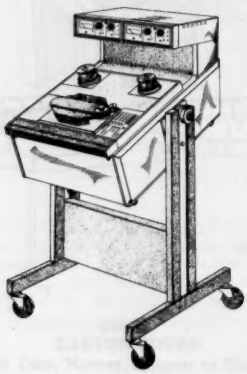
248,098
ANALYTICAL INSTRUMENT SYSTEM
Eugene N. Giancarlo, and James J. Ladue, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1975, Ser. No. 619,105
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



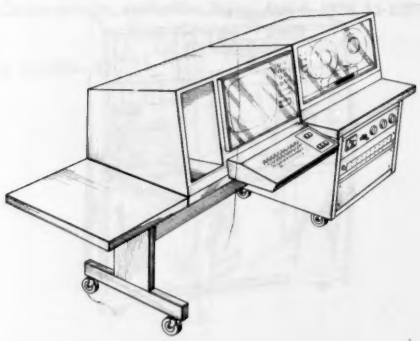
248,099
TAPE TRANSPORT
George A. Wilson, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 17, 1976, Ser. No. 667,651
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—41



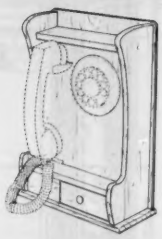
248,100
MAGNETIC TAPE TRANSPORT
Robert W. Bornschlegel, Mountain View, and Francis Arden Farey, Menlo Park, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.
Filed Jun. 16, 1976, Ser. No. 696,684
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—41



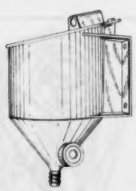
248,101
ELECTRONIC CONTROL AND DISPLAY CONSOLE
John Budd Steinhilber, and Stanley Heins, both of Mill Valley, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Oct. 28, 1975, Ser. No. 625,808
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—44



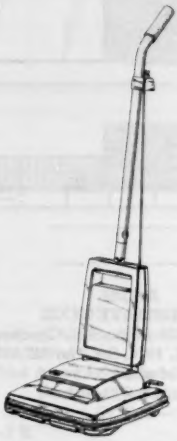
248,102
WALL MOUNT TELEPHONE CASE
Arthur H. Blake, 2931 Randy La., Dallas, Tex. 75234
Filed Jul. 26, 1976, Ser. No. 708,765
Term of patent 14 years
Int. Cl. D14—*03;* D6—*04*
U.S. Cl. D14—61



248,103
POWDER DETERGENT DISPENSER
Spencer Brian Larson, South St. Paul, and Duane Leroy Salmonson, West St. Paul, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.
Filed Dec. 11, 1975, Ser. No. 639,844
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—36

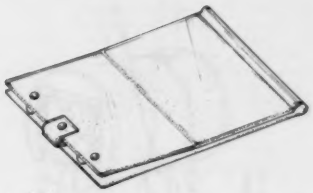


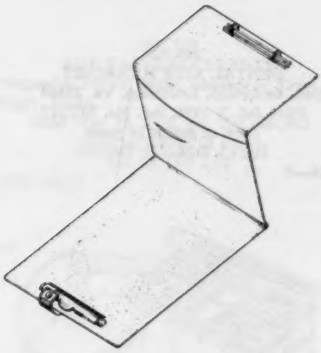
248,104
UPRIGHT VACCUM CLEANER
Earl R. Clowers, Anderson; John C. Davis, Greenwood; Fred E. Pearman, Jr., Five Forks Community, and Don W. Vermillion, Anderson, all of S.C., assignors to The Singer Company
Filed Mar. 10, 1977, Ser. No. 776,153
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53



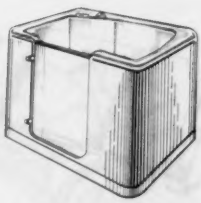
248,105
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 9, 1976, Ser. No. 656,563
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

248,106
PRESENTATION FOLDER
William T. Moses, 3215 Stonehenge, Carrollton, Tex. 75006
Filed Mar. 26, 1976, Ser. No. 670,895
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

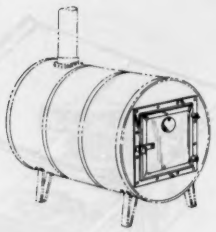




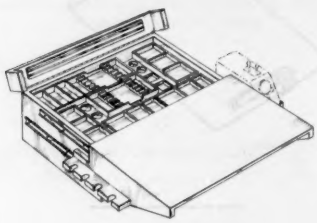
248,107
SIT-UP BATHTUB
Thomas Brengord, and Robert D. Copeland, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
Continuation-in-part of Ser. No. 302,106, Oct. 30, 1972, abandoned. This application Nov. 5, 1976, Ser. No. 739,336
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



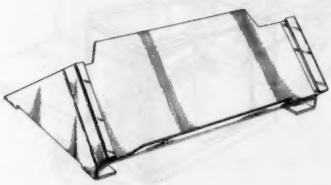
248,108
BARREL HEATER DOOR
Leonard Sotz, 23797 Sprague Rd., Columbia Station, Ohio 44028
Filed Apr. 26, 1976, Ser. No. 672,764
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128



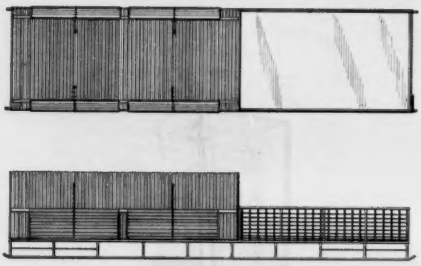
248,109
DENTAL AIDE'S CABINET
Warner J. Ball, Kenbridge, Kenbridge, Va. 23944
Filed Jul. 7, 1976, Ser. No. 703,217
Term of patent 14 years
Int. Cl. D24—*01;* D6—*04*
U.S. Cl. D24—5



248,110
HOLDER FOR OPTHALMIC INSTRUMENT CONTROL PANEL
John R. Wright, Tonawanda, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 19, 1976, Ser. No. 659,434
Term of patent 14 years
Int. Cl. D24—*99;* D6—*04;* D19—*02*
U.S. Cl. D24—31

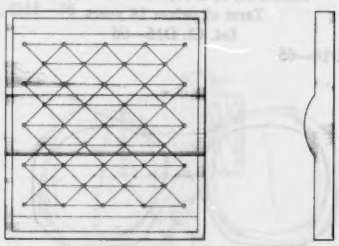


248,111
PORTABLE ANIMAL ENCLOSURE
Neil A. Koster, Rte. 1, Sylvia, Kans. 67581
Continuation-in-part of Ser. No. 704,462, Jul. 12, 1976. This application Mar. 7, 1977, Ser. No. 774,737
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—1



248,112
MARIONETTE DUCK
Loren A. Seggerman, 14675 Adams Rd., Granger, Ind. 46530
Filed Nov. 1, 1976, Ser. No. 737,893
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 B

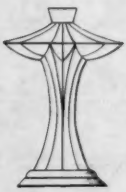
248,113
GAME BOARD
Straud D. Herriman, 229 Kentucky Ave., Danville, Ill. 61832
Filed Dec. 5, 1975, Ser. No. 638,284
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,114
EXERCISER
Philip Mangiapane, 1201 Roebuck Ct., West Palm Beach, Fla. 33401
Continuation of Ser. No. 523,998, Nov. 15, 1974, abandoned, which is a continuation of Ser. No. 287,798, Sep. 11, 1972, abandoned. This application Dec. 29, 1975, Ser. No. 644,745
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 K

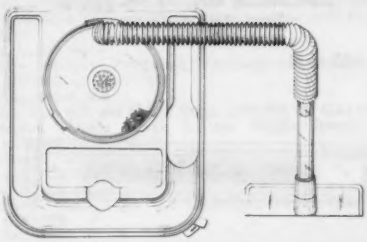
248,115
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,850
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

248,116
SET OF CHESSMEN OR SIMILAR ARTICLE
John Zamkovec, c/o Nancy Lavallee, 142 W. 49th St., and Nancy Lavallee, 142 W. 49th St., both of New York, N.Y. 10019
Filed Aug. 5, 1976, Ser. No. 711,988
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

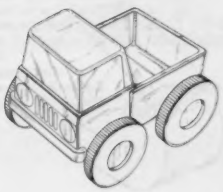


248,117
GOLF PUTTER HEAD
Peter Mondy, 137 W. Naomi, Arcadia, Calif. 91006
Filed Apr. 6, 1976, Ser. No. 674,292
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

248,118
TOY VACUUM CLEANER
Yoshizo Nagasaka, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 10, 1976, Ser. No. 684,842
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

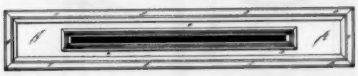


248,119
TOY TRUCK
Donald F. Nix, Hanover Park, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sep. 16, 1976, Ser. No. 723,740
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



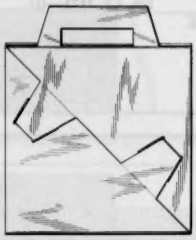
248,120
TORCH OR SIMILAR ARTICLE
Bik Kwan Ho, 50-56 Mong Kok Rd., 3rd Floor, Flat B Sun Mong House, Kowloon, Hong Kong
Filed Jul. 5, 1977, Ser. No. 812,454
Claims priority, application United Kingdom, Mar. 29, 1977, 979472/77
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

248,121
FRONT DISPLAY PANEL FOR VENDING MACHINES
Walter E. Moore, Bel-Nor, and Albert K. Grethey, Bridgeton, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.
Filed Jun. 28, 1976, Ser. No. 700,525
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R

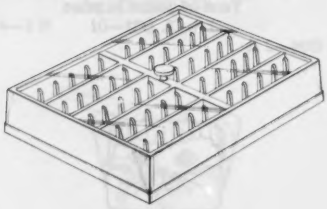


248,122
HAND HELD MUSICAL STRING VIBRATION INITIATOR AND SUSTAINER
Gregory S. Heet, 611 Duscommun St., Los Angeles, Calif. 90012
Filed Aug. 24, 1976, Ser. No. 717,507
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

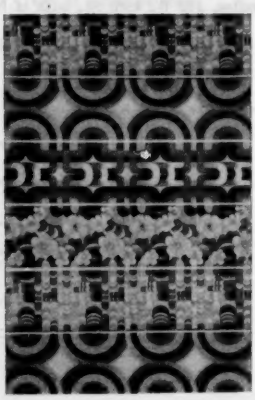
248,123
CARRYING CARTON FOR SHOES OR THE LIKE
William Jay Cohen, Hingham, Mass., assignor to CITC Industries, Inc., New York, N.Y.
Filed Jan. 23, 1976, Ser. No. 651,957
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



248,124
STORAGE TRAY FOR PHOTOGRAPHIC SLIDES
Glen J. Brown, 386 E. Poppyfields Dr., Altadena, Calif. 91001
Filed Aug. 30, 1976, Ser. No. 718,593
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



248,125
TAPESTRY FABRIC OR SIMILAR ARTICLE
Roland Ditzel, Beethovenstrasse 35, 6901 Bammental, Germany
Filed Feb. 13, 1976, Ser. No. 657,972
Claims priority, application Germany, Aug. 15, 1975, 42 AR 348
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 LL



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PATENTS WERE ISSUED ON THE 6TH DAY OF JUNE, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Akerlund & Rausing: *See*—
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AB Bofors: *See*—
Gustavsson, Lars G. T.; and Svensson, Sven-Hakan, 4,092,901, Cl. 89-46.000.

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Adams, George. Fishing hook. 4,092,796, Cl. 43-44.830.

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Andres, Klaus. Apparatus for the measurement of vehicle fuel consumption. 4,092,851, Cl. 73-114.000.

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ap Rhys, Tomos L., to United States of America, Navy. Motion-compensation arrangements for MTI radars. 4,093,950, Cl. 343-7.700.

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Banucci, Eugene George; and Olander, Walter Karl, to General Electric Company. Oxidative coupling of phenolic monomers in the presence of manganese complexes of manganese phenyl benzoin oxime catalysts. 4,093,598, Cl. 260-47.0ET.

Barbarow, Charles E. Golf game. 4,093,233, Cl. 273-176.00A.

Barber, Thomas W.; and Proctor, Miles W., to Donovan Construction Company. In situ concrete pipe forming machine. 4,093,409, Cl. 425-59.000.

Barclay, Robert H.: *See—*
Weskamp, Robert J.; and Barclay, Robert H., 4,093,758, Cl. 428-8.000.

Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., to United States of America, Army. Ground-controlled guided-missile system. 4,093,153, Cl. 244-3.140.

Barnabe, Charles E., to Passavant Corporation. Process and apparatus for the incineration of solid fuel material. 4,092,935, Cl. 110-186.000.

Barnak, John A., to Litton Business Systems, Inc. Document imprinter. 4,092,920, Cl. 101-77.000.

Barnes, J. Haywood, to Oldham, Edwin W.; and Oldham, Vern L., a part interest to each. Meat extruder having double blade cutter bar. 4,093,128, Cl. 241-82.500.

Barraud, Andre; Gras, Roger; and Vandevyver, Michel, to Commissariat a l'Energie Atomique. Method of forming and depositing monomolecular layers of amphiphilic molecules on a substrate. 4,093,757, Cl. 427-434.00A.

Barry, Dennis P., to Publishers Planning Inc. Tourist game. 4,093,235, Cl. 273-254.000.

Barthell, Eduard: *See—*
Dahmen, Kurt; Hubner, Wolfgang; and Barthell, Eduard, 4,093,542, Cl. 210-54.000.

Barton, C. Dickinson. Golf practice device. 4,093,234, Cl. 273-200.00R.

BASF Aktiengesellschaft: *See—*
Buechner, Oskar; Geierhaas, Herbert; Gierth, Volker; Mueller, Siegfried; and Zacher, Wieland, 4,093,703, Cl. 423-245.000.
Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, 4,093,795, Cl. 528-481.000.
Burdorf, Donald L.; and Bjordahl, James, 4,093,150, Cl. 242-192.000.
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.
Reiss, Wolfgang; Joschek, Hans-Ingo; Schnur, Rudolf; Winderl, Siegfried; Dehler, Juergen; and Hoffmann, Herwig, 4,093,668, Cl. 568-855.000.

BASF Wyandotte Corporation: *See—*
Compton, John William; and Eisenstein, Stephen Ellis, 4,093,418, Cl. 8-142.000.
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T.; and Murphy, John R., 4,093,573, Cl. 260-2.5BE.
Weipert, Eugene A.; and Deck, Charles F., 4,093,676, Cl. 260-857.0PG.

Bastian, Gary T.: *See—*
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Basu, Samir: *See—*
Fuller, Paul; Gillender, John Brian; Shacklady, Michael; and Basu, Samir, 4,093,999, Cl. 364-900.000.

Baudin, Jacques, to Societe Lannionnaise d'Electronique SLE-Citerel S. A. Switching networks, e.g. space-division concentrators. 4,093,828, Cl. 179-18.0FC.

Bauer, Fritz, to Suspa Federungstechnik Fritz Bauer & Sohne OHG. Length-adjustable gas spring. 4,093,196, Cl. 267-65.00R.

Bauer, Johann; and Heckmaier, Joseph, to Wacker-Chemie GmbH. Process for suspension polymerization of vinyl chloride with molecular oxygen. 4,093,791, Cl. 526-200.000.

Bausch & Lomb Incorporated: *See—*
Mohrman, Richard C.; and Seidenberg, Richard L., 4,093,360, Cl. 351-13.000.

Baxter, Bobby G., to Binkley Company, The. Cargo carrier. 4,093,266, Cl. 280-491.00R.

Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., to J. T. Baker Chemical Co. Automatic blood analyzing system. 4,093,849, Cl. 235-92.0PC.

Baxter Travenol Laboratories, Inc.: *See—*
Cullis, Herbert M., 4,093,545, Cl. 210-86.000.
Fowles, Thomas A.; and Winchell, David A., 4,093,093, Cl. 215-251.000.
Winchell, David A., 4,093,169, Cl. 248-311.300.

Bayer Aktiengesellschaft: *See—*
Block, Hans-Dieter, 4,093,679, Cl. 260-927.00R.
Heine, Heinrich; Woditsch, Peter; Bohmann, Theodor; and Rade, Dieter, 4,093,777, Cl. 428-403.000.
Klauke, Erich; and Buttner, Gerhard, 4,093,669, Cl. 260-651.00F.
Knofel, Hartmut; and Ellendt, Gunther, 4,093,658, Cl. 260-570.00D.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,093,718, Cl. 424-200.000.
Metzger, Carl; Jager, Gerhard; and Lurssen, Klaus, 4,093,447, Cl. 71-111.000.
Reischl, Artur; Jabs, Gert; and Gonzalez-Dorner, Alberto Carlos, 4,093,569, Cl. 260-2.5AM.
Schmidt, Robert Rudolf; and Rohe, Lothar, 4,093,442, Cl. 71-90.000.
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,093,722, Cl. 424-246.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,093,446, Cl. 71-109.000.

Bayne, Robert T., to Standard Changemakers, Inc. Vibratory coin feeder. 4,092,990, Cl. 133-1.00R.

BBC Brown Boveri & Company Limited: *See—*
Liptak, Gabor; and Schuler, Roland, 4,093,881, Cl. 310-214.000.

Beach, Ronald O., to Schulmerich Carillons, Inc. Multiple selective bell console and instrument. 4,092,893, Cl. 84-1.110.

Beaton, Arthur L.; and Weygant, Nelson E., to Corrigan, Steven P. Precarburetor ignition system. 4,092,962, Cl. 123-133.000.

Beaver, Richard N.; and Becker, Charles W., to Dow Chemical Company, The. Bonded asbestos diaphragms. 4,093,533, Cl. 204-296.000.

Becker, Charles W.: *See—*
Beaver, Richard N.; and Becker, Charles W., 4,093,533, Cl. 204-296.000.

Becorit Grubenausbau GmbH: *See—*
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Becton, Dickinson Electronics Company: *See—*
Wilner, Leslie B., 4,093,933, Cl. 338-42.000.

Beecham Group Limited: *See—*
Gardner, Derek Victor, 4,093,631, Cl. 260-345.200.
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Beguin, Jean-Luc: *See—*
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Behn, Rudolf: *See—*
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Behrenz, Wolfgang: *See—*
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Bell & Howell Company: *See—*
Gish, David B., 4,093,965, Cl. 360-65.000.
Hapke, Kenyon A., 4,093,366, Cl. 352-198.000.
Karsh, Irving, 4,093,151, Cl. 242-198.000.
Rabindran, Karavattuveetil George; and Flint, John R., 4,093,376, Cl. 355-68.000.

Bell, Lon E., to Technar, Incorporated. Mechanical rolamite impact sensor. 4,092,926, Cl. 102-204.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Bjorklund, Gary Carl; Mollenauer, Linn Frederick; and Tomlinson, Walter John, III, 4,093,338, Cl. 350-3.700.
Bobeck, Andrew Henry, 4,094,002, Cl. 365-1.000.
Cross, Peter Stanley, 4,093,339, Cl. 350-3.700.
Damen, Theodoor Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,093,344, Cl. 350-147.000.
Hargrove, Logan Ezral, 4,093,343, Cl. 350-96.300.
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,093,774, Cl. 428-379.000.
Koontz, Donald Eldridge; and Landau, Uziel, 4,093,520, Cl. 204-15.000.
Logan, Ralph Andre; Reinhart, Franz Karl; and Sinclair, William Robert, 4,093,345, Cl. 350-355.000.
Molchan, Andrew John, 4,093,331, Cl. 339-39.000.

Bellas, Frederic Edward; and Decker, Robert Anthony. Domed roof structures for easy assembly and dismantling. 4,092,809, Cl. 52-63.000.

Belous, Viktor Mikhailovich; Yagupolsky, Lev Moiseevich; Alexeeva, Ljubov Antonovna; Sokolov, Sergei Vasilievich; and Ponomarev, Alexei Ivanovich. Aryl perfluoro-alkyl ethers and method of producing them. 4,093,665, Cl. 260-612.00D.

Belyaev, Vladimir Mikhailovich: *See*—
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.

Belyansky, Andrei Dmitrievich: *See*—
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Benatar, Leo: *See*—
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Bendix Corporation, The: *See*—
Henry, James L.; and Ruoff, Carl F., Jr., 4,092,854, Cl. 73-133.00R.
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Benedikt, Walter: *See*—
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Benezra, Leo L.: *See*—
Babinsky, Andrew D.; and Benezra, Leo L., 4,093,531, Cl. 204-265.000.

Bennes Marrel: *See*—
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Bentz, Gerard: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,093,553, Cl. 252-70.000.

Benz, Mark R.: *See*—
Doyle, Barry N.; Seibt, Willie H.; Sarkar, Kshitindra Mohan; and Benz, Mark R., 4,093,450, Cl. 75-0.5AA.

Berens, Tadeusz; and Mansson, Ragnar, to Aktiebolaget Asea-Atom. Water moderated reactor. 4,093,513, Cl. 176-37.000.

Berges, David A., to SmithKline Corporation. 7-Acyl-3-(sulfonic acid and sulfamoyl substituted tetrazolyl thiomethyl) cephalosporins. 4,093,723, Cl. 424-246.000.

Bergstrom, Gary E.: *See*—
Sharp, Walter M.; and Bergstrom, Gary E., 4,093,831, Cl. 179-100.1VC.

Bernard, Arthur Alexander; and Bernard, Richard Allen, to Darex Corporation. Chuck. 4,093,247, Cl. 279-53.000.

Bernard, Richard Allen: *See*—
Bernard, Arthur Alexander; and Bernard, Richard Allen, 4,093,247, Cl. 279-53.000.

Bernazzani, Richard J., to United States of America, Army. Field range cabinet. 4,092,973, Cl. 126-37.00B.

Berner, Godwin: *See*—
Habermeier, Jurgen; and Berner, Godwin, 4,093,639, Cl. 260-429.900.

Bertrand, John: *See*—
Flink, Joseph H.; and Bertrand, John, 4,093,989, Cl. 364-485.000.

Betz Laboratories, Inc.: *See*—
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,093,580, Cl. 260-29.6SQ.
Schieber, John R., 4,093,020, Cl. 165-1.000.

Bielawski, William E. Envelopes. 4,093,074, Cl. 206-629.000.

Bigelow, John E., to General Electric Company. Transflective liquid crystal display. 4,093,356, Cl. 350-338.000.

Bindel, Paul. Undulating rectal flushing apparatus. 4,092,984, Cl. 128-229.000.

Binkley Company, The: *See*—
Baxter, Bobby G., 4,093,266, Cl. 280-491.00R.

Bjordahl, James: *See*—
Burdorf, Donald L.; and Bjordahl, James, 4,093,150, Cl. 242-192.000.

Bjorklund, Gary Carl; Mollenauer, Linn Frederick; and Tomlinson, Walter John, III, to Bell Telephone Laboratories, Incorporated. Apparatus for piecewise generation of grating-like patterns. 4,093,338, Cl. 350-3.700.

Black Clawson Company, The: *See*—
Nowisch, Heinz K., 4,092,886, Cl. 83-56.000.

Black, Robert R., Jr., to Plastics Research Corporation. Variable attenuation support system. 4,093,072, Cl. 206-521.000.

Blackburn, James R.; and Smith, Dudley C., to John E. Mitchell Company. Torque-transmitting, torque sensing system. 4,093,055, Cl. 192-116.500.

Blackburne, Owen Rodney; and Shapiro, Warren B., to Noxell Corporation. Oral hygiene. 4,093,711, Cl. 424-54.000.

Blackwell, Lyman L., to Statitrol Corporation. Aerosol detection device. 4,093,886, Cl. 313-54.000.

Blake, Eugene H. Chain elongation gauge. 4,092,781, Cl. 33-143.00J.

Blalock, Donald Raeford; and Carrington, Julian Lesco, III, to AMP Incorporated. Method for making electrical connectors. 4,093,480, Cl. 156-54.000.

Blanco, Jorge L.; Crnojevich, Ranko P.; and Simons, Courtney S., to Amax Inc. Hydrometallurgical leaching and refining of nickel-copper concentrates, and electrowinning of copper. 4,093,526, Cl. 204-104.000.

Blankenship, Thomas O.: *See*—
Luebbert, William K.; Blankenship, Thomas O.; and Freeman, Roy H., 4,093,395, Cl. 408-224.000.

Bleha, William P., Jr.: *See*—
Jacobson, Alexander D.; Grinberg, Jan; Braatz, Paul O.; and Bleha, William P., Jr., 4,093,357, Cl. 350-338.000.

Block, Hans-Dieter, to Bayer Aktiengesellschaft. Hydroxyalkyl or aminoalkyl esters of phospholane phosphonic and phosphinic acids. 4,093,679, Cl. 260-927.00R.

Bloem, Jan; and Bouwknegt, Albert, to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,093,889, Cl. 313-229.000.

Blunt, Roy Trevor: *See*—
Carter, Christopher Frederick; Blunt, Roy Trevor; Lewis, James Cyril Alexander; and Garner, Geoffrey Michael, 4,093,534, Cl. 350-355.000.

Bobeck, Andrew Henry, to Bell Telephone Laboratories, Incorporated. Sacrificial arc suppressors in magnetic bubble memories. 4,094,002, Cl. 365-1.000.

Bobrowski, Miroslaw: *See*—
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Bobylev, Leonid Semenovich: *See*—
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Bodner, Ronald Eugene; Crooks, Thomas Lee; and Kiscaden, Richard Craig, to International Business Machines Corporation. Address translation with storage protection. 4,093,986, Cl. 364-200.000.

Boehmer, Branislav: *See*—
Hoppe, Lutz; Boehmer, Branislav; and Behn, Rudolf, 4,093,605, Cl. 260-78.0SC.

Boehringer Ingelheim GmbH: *See*—
Kruger, Gerd; Keck, Johannes; Noll, Klaus Reinhold; Pieper, Helmut; Ziegler, Harald; Ballhause, Helmut; and Kahling, Joachim, 4,093,734, Cl. 424-274.000.

Boeing Company, The: *See*—
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Boesch, William J., to Special Metals Corporation. Nickel base alloy. 4,093,476, Cl. 148-32.500.

Boesten, Wilhelmus H. J., to Stamicarbon, B.V. Process for the preparation of optically active phenyl glycine amide. 4,093,653, Cl. 260-558.00A.

Boettcher, William A. Securing means for parquet floor boards. 4,093,494, Cl. 156-577.

Bohinc, Richard J.; Tragesser, Charles W.; Vaill, Ronald E.; and Racki, Francis R., to Westinghouse Electric Corp. Oil circuit-breaker pump-assembly with improved shunting contact structure. 4,093,837, Cl. 200-150.00G.

Bohman, Gote Hubert, to B.V. Foco Nederland. Arrangement particularly in goods vehicle for conveyance of load carriers positioned in double or multiple rows. 4,093,089, Cl. 214-516.000.

Bohmann, Theodor: *See*—
Heine, Heinrich; Woditsch, Peter; Bohmann, Theodor; and Rade, Dieter, 4,093,777, Cl. 428-403.000.

Boitel, Marius Charles; and Renault, Serge Andre Maurice, to Corning Glass Works. Process to obtain transparent colorless and glass-ceramics so obtained. 4,093,468, Cl. 106-39.700.

Bollmer, Jacob A., to Dayco Corporation. Printing blanket holding apparatus. 4,092,923, Cl. 101-415.100.

Bolotnov, Alexandr Vladimirovich: *See*—
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Bompane, Gianfranco: *See*—
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Bonds, James Vaull, to McEvoy Oilfield Equipment Company. Run-in and tie back apparatus. 4,093,030, Cl. 166-315.000.

Bonds, Kip M.: *See*—
Hetke, Adolf; and Bonds, Kip M., 4,093,770, Cl. 428-306.000.

Bonola, Giuseppe: *See*—
Sianesi, Enrico; Bonola, Giuseppe; Setnikar, Ivo; and Magistretti, Maria Jose, 4,093,648, Cl. 260-519.000.

Bonola, Paola: *See*—
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Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. 5-Sulfamoylbenzoic acid derivatives carrying a heterocyclic substituent. 4,093,735, Cl. 424-274.000.

Borner, Hans G. K., to Gerlach-Werke GmbH. Track construction for tracked land vehicles such as tanks. 4,093,319, Cl. 305-58.00R.

Borowski, Edward: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Borrajo, Orlando: *See—*
Verdesca, Anthony Fredrick; and Borrajo, Orlando, 4,093,279, Cl. 285-23.000.

Borreson, Edgar L. Precast adjustable foundation for small equipment. 4,093,164, Cl. 248-20.000.

Bost, Pierre-Etienne; and Costantini, Michel, to Rhone - Poulenc Industries. Epoxidation of olefinic compounds. 4,093,636, Cl. 260-348.290.

Botta, Frank J.: *See—*
Moll, William F., Jr.; and Botta, Frank J., 4,093,564, Cl. 252-518.000.

Bouchey, George J.: *See—*
Dashner, Richard F.; and Bouchey, George J., 4,092,812, Cl. 52-309.300.

Bousquet, Jacques, to Etablissements Tiflex Societe Anonyme. Stencil-cutting machine. 4,092,890, Cl. 83-284.000.

Boutant, Jean-Jacques, to Regie Nationale Des Usines Renault. Stuffing-box seal particularly for rotating shafts. 4,093,244, Cl. 277-153.000.

Boutle, David Leonard: *See—*
McGrail, Patrick Terence; Smith, Stephen Richard; Bannister, Frederick Robert; and Boutle, David Leonard, 4,093,458, Cl. 96-87.00R.

Bouwknegt, Albert: *See—*
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Boyer, Ambroise O. Apparatus for carrying glass panels. 4,093,251, Cl. 280-46.000.

Bozeman, Hoyt W., Jr.: *See—*
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Braatz, Paul O.: *See—*
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Bracke, William J. I., to Labofina S.A. Polyphenylene resins. 4,093,790, Cl. 526-144.000.

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Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 4,093,803, Cl. 544-27.000.

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Brandon, Clarence W., to Brandon, Orpha B., a part interest. Methods of use of cementitious materials and sonic or energy-carrying waves within subsurface formations. 4,093,028, Cl. 166-281.000.

Brandon, Orpha B.: *See—*
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Brandstrom, Karl Peter: *See—*
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Brandt, Richard Thornton; and Hein, Paul William, to General Electric Company. Gantry for computed tomography. 4,093,862, Cl. 250-445.00T.

Braner Enterprises, Inc.: *See—*
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Branibar, Nick G., to Anken Industries. Recovery of silver from photographic film. 4,093,532, Cl. 204-271.000.

Bratslavskaya, Alla Lvovna; Makarova, Serafima Borisovna; Mushy, Roman Yakovlevich; Myasoedova, Galina Vladimirovna; Savvin, Sergei Borisovich; and Seraya, Vera Ivanovna. Copolymerization product of N-vinylmethylpyrazole and divinyl cross-linking agent and method of preparing same. 4,093,792, Cl. 526-200.000.

Braun, Bernard. Partitioned plastic case. 4,093,101, Cl. 220-22.000.

Braun, Stephen Alphonse: *See—*
Moore, James Walter; and Braun, Stephen Alphonse, 4,093,039, Cl. 181-229.000.

Brauns, Jurgen: *See—*
Bahre, Gerhard; Brauns, Jurgen; and Struck, Willi, 4,092,839, Cl. 68-19.000.

Bray, Thomas. Gauge for indicating available water supply. 4,092,948, Cl. 116-114.0PV.

Bremer, Noel J.; White, James F.; and Milberger, Ernest C., to Standard Oil Company, The. Preparation of maleic anhydride from four-carbon hydrocarbons. 4,093,635, Cl. 260-346.750.

Breneman, Inc.: *See—*
Erpenbeck, Paul J., 4,092,775, Cl. 30-95.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. [[[(2,4-Dioxo-1-imidazolidinyl)amino]carbonyl]amino}-acetylcephalosporin derivatives. 4,093,801, Cl. 544-25.000.

Brewster, Donald H. Hay baler. 4,092,818, Cl. 56-341.000.

Brian, William Stanley. Fuel-operated device. 4,093,405, Cl. 417-343.000.

Briar, Thomas J.; and Reese, Walter J., to PPG Industries, Inc. Expandable collet. 4,093,137, Cl. 242-46.400.

Briefer, Dennis K., to Setra Systems, Inc. Capacitance measuring system. 4,093,915, Cl. 324-60.00R.

Briston, Rodney J.; and Canning, Rodger G., to Reed International Limited. Sheet materials. 4,093,686, Cl. 264-45.500.

British Hydromechanics Research Association, The: *See—*
Fisher, Martin John, 4,092,889, Cl. 83-177.000.

British Steel Corporation: *See—*
Spenceley, Gene Donald; and Pigott, Neil, 4,093,452, Cl. 75-53.000.

Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. 4-Hydroxy-3,4-dihydro-2(1H)-quinazolinethiones. 4,093,805, Cl. 544-116.000.

Brock, Andrew J.: *See—*
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,093,782, Cl. 428-654.000.

Bromer, Gunter, to Siemens Aktiengesellschaft. Method for automatically varying the feed rate of a workpiece carriage in a machine tool. 4,092,887, Cl. 83-56.000.

Bromley, James E.; McNamara, Michael M.; and Mowe, Wayne T., to Monsanto Company. Flat nylon 66 yarn having a soft hand, and process for making same. 4,093,147, Cl. 242-159.000.

Brown, David Edward, to Ampex Corporation. Transducer assembly vibration sensor. 4,093,885, Cl. 310-331.000.

Brown, John M.: *See—*
Schure, Ralph M.; Kooi, John H.; and Brown, John M., 4,093,675, Cl. 260-835.000.

Brown, Lee Roy; and Davison, Thomas M., to Sie, Inc. Well-logging camera using modulated laser light path for exposing in camera processable electrographic film. 4,093,955, Cl. 354-3.000.

Brown, Thomas Henry; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Process for preparing heterocyclicalkylthioalkyl-N-cyanoguanidines and thioureas. 4,093,621, Cl. 260-294.80H.

Browne, Thomas J., to Lehigh Valley Industries, Inc. Bag forming apparatus. 4,093,500, Cl. 156-510.000.

Browning, Vernon D., to Dayco Corporation. Method of making a rubber article having a permanent marking herein. 4,093,694, Cl. 264-246.000.

Browning, William W.; and Legacy, Donald J., to Turbodyne Corporation (Steam Turbine Division). Method for making a diaphragm with cast nozzle blocks. 4,092,768, Cl. 29-156.80R.

Brudevold, Finn, to Atex, Incorporated. Graphics display unit. 4,094,000, Cl. 364-900.000.

Brunswick Corporation: *See—*
Draxler, James Richard, 4,093,906, Cl. 322-51.000.
Hale, David Jerry, 4,092,958, Cl. 123-73.0PP.

Bryan, Larry Wayne; Himmel, David Paul; and Woster, George William, Jr., to Recognition Equipment Incorporated. Slope feature detection system. 4,093,941, Cl. 340-146.3AE.

Bryant, Ivan L. Fishing pole mount and signal. 4,092,795, Cl. 43-17.000.

Bubela, Nikolai Stepanovich: *See—*
Balyko, Georgy Semenovich; and Bubela, Nikolai Stepanovich, 4,093,131, Cl. 242-6.000.

Buck Stove Marketing, Corp.: *See—*
Buckner, Carrol E., 4,092,976, Cl. 126-63.000.

Bucknavich, James L. Removable threaded insert. 4,093,011, Cl. 151-57.000.

Buckner, Carrol E., to Buck Stove Marketing, Corp. Air conditioner. 4,092,976, Cl. 126-63.000.

Buechner, Oskar; Geierhaas, Herbert; Gierth, Volker; Mueller, Siegfried; and Zacher, Wieland, to BASF Aktiengesellschaft. Removal of ethylene from gases. 4,093,703, Cl. 423-245.000.

Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, to BASF Aktiengesellschaft. Multi-stage isolation of high pressure polyethylene. 4,093,795, Cl. 528-481.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,640, Cl. 260-429.900.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,806, Cl. 544-165.000.

Buluk, Helena: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Bundy, Gordon L., to Upjohn Company, The. Inter-oxa-13,14-dihydro-9-deoxy-PGF compounds. 4,093,813, Cl. 560-121.000.

Bunker Ramo Corporation: *See—*
Simko, Paul S., 4,093,332, Cl. 339-49.00R.

Bunkowski, Kenneth Dana: *See—*
DeLapp, Darwin Fiske; Goebel, James Christopher; and Bunkowski, Kenneth Dana, 4,093,579, Cl. 260-29.40R.

Burchers, Samuel A. Modular ball rebound apparatus. 4,093,218, Cl. 273-29.00A.

Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Two-circuit brake system for motor vehicles. 4,093,313, Cl. 303-6.00C.

Burdette, Stephen D.: *See—*
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,093,048, Cl. 192-13.00R.

Burdorf, Donald L.; and Bjordahl, James, to BASF Aktiengesellschaft. Method and apparatus for providing constant magnetic tape tension. 4,093,150, Cl. 242-192.000.

Burgers, Gerrit, to International Business Machines Corporation. Single revolution mechanism. 4,093,056, Cl. 192-127.000.

Burgess, Robin Henry; and Greaves, Jeffrey Chester, to Imperial Chemical Industries Limited. Vinyl chloride polymerization process. 4,093,787, Cl. 526-62.000.

Burig, Robert G.; and McNally, Paul F., to Contraves Goerz Corporation. Multi-axis motion generator utilizing feedforward control. 4,093,904, Cl. 318-616.000.

Buril, Robert T. Hanger bracket. 4,093,168, Cl. 248-220.400.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-((4-(2,2-Dichloro-1,1-difluoroethoxy)-2-

methyl-5-nitrophenyl)sulfonyl)-2-propenenitrile. 4,093,644, Cl. 260-465.00F.

Burkholder, Theodore B.; and Stalter, Robert J., to Goodyear Tire & Rubber Company, The. Contoured foam seat. 4,092,751, Cl. 5-345.00R.

Burkl, Erich: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,093,053, Cl. 192-98.000.

Burmistrov, Gennady Nikolaevich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Burrell, Charles A.: *See—*
Rue, John Rego, 4,093,252, Cl. 280-87.04A.

Burrough, Donald E.; and Seefeld, Dean E., to Gehl Company. Baling machine including means for adjusting alignment of conveyor belts. 4,092,914, Cl. 100-88.000.

Burroughs Corporation: *See—*
Chu, Bing-Lun; Subbarao, Wunnava Venkata; Peale, Jack; McCune, Kent; and Steiner, Marvin Elroy, 4,093,971, Cl. 361-382.000.
Dimyan, Magid Yousri, 4,094,004, Cl. 365-8.000.
Dimyan, Magid Yousri, 4,094,006, Cl. 365-39.000.
Hall, Dennis G., 4,093,966, Cl. 360-109.000.
Horak, Anthony, 4,093,061, Cl. 400-194.000.
McAllister, John P.; Schroeder, Franklin Theodore; and Stimson, Charles Terrance, 4,093,981, Cl. 364-200.000.
Paulinski, Ronald Adam, 4,093,851, Cl. 235-302.200.
Sayer, Trevor Anthony, 4,092,934, Cl. 109-24.100.
Taylor, Jerry H.; and Turula, Gabriel T., 4,093,772, Cl. 428-339.000.

Burton, Larry D. Security locking device for louvre and jalousie windows. 4,093,286, Cl. 292-259.00R.

Busch, Joachim: *See—*
Heinlein, Karl Hans; and Busch, Joachim, 4,093,417, Cl. 8-137.000.

Bushell, John Leo Thomas: *See—*
Plumb, George Arthur; Bushell, John Leo Thomas; and Radford, Patrick Louis, 4,093,871, Cl. 307-106.000.

Business Education Products, Inc.: *See—*
Sharp, Walter M.; and Bergstrom, Gary E., 4,093,831, Cl. 179-100.1VC.

Buss, Kenneth George, to Texas Instruments Incorporated. Microcomputer processing approach for a non-volatile TV station memory tuning system. 4,093,921, Cl. 325-459.000.

Buss, Kenneth George, to Texas Instruments Incorporated. Microcomputer processing approach for a non-volatile TV station memory tuning system. 4,093,922, Cl. 325-459.000.

Butoi, Aristotel. Automatic hygienic washing machine. 4,092,744, Cl. 4-7.000.

Butskoi, Jury Alexandrovich: *See—*
Eliseev, Stanislav Borisovich; Butskoi, Jury Alexandrovich; Dmitrievsky, Vladimir Sergeevich; Golubeva, Albina Andreevna; Ozerov, Vladimir Mikhailovich; Volkov, Valentin Stepanovich; and Vasninova-Shipulina, Iya Petrovna, 4,093,448, Cl. 75-3.000.

Butti, Adriano; and Gazzani, Giovanni, to Prephar Prospection de Recherches Pharmaceutiques S.A. Methods of using spermicidal vaginal compositions comprising 1,2-benzisothiazole derivatives. 4,093,730, Cl. 424-270.000.

Buttner, Gerhard: *See—*
Klauke, Erich; and Buttner, Gerhard, 4,093,669, Cl. 260-651.00F.

Butwell, Kenneth Francis, to Union Carbide Corporation. Process for acid gas removal. 4,093,701, Cl. 423-228.000.

B.V. Foco Nederland: *See—*
Bohman, Gote Hubert, 4,093,089, Cl. 214-516.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Rainer, Georg, 4,093,812, Cl. 548-374.000.

Bylec, Elzbieta: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Cackley, George W.: *See—*
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,093,048, Cl. 192-13.00R.

Cagliero, Germano, to Marxer S.p.A. Method of and fodder for rearing white-meat calves for slaughter. 4,093,746, Cl. 426-2.000.

Cagliero, Germano, to Marxer S.p.A. Method of and fodder for pig-raising. 4,093,747, Cl. 426-2.000.

Calvert, Rodney K.; and Scott, Dale K., to Mead Corporation, The. Article handling means for a packaging machine. 4,093,063, Cl. 198-425.000.

Campbell, John J., to Caterpillar Tractor Co. Floating carrier retention for a planetary gearset. 4,092,878, Cl. 74-801.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Olive, Graham; Lake, Royston Ernest Walter; and Dionne, Joseph Guy Gilles, 4,093,852, Cl. 250-213.00A.

Canadian Patents and Development Limited: *See—*
Kinsner, Witold; and Della Torre, Edward, 4,094,003, Cl. 365-7.000.

Canfield, David L., to Park Rubber Company. Railroad crossing structure. 4,093,120, Cl. 238-8.000.

Canning, Rodger G.: *See—*
Briston, Rodney J.; and Canning, Rodger G., 4,093,686, Cl. 264-45.500.

Cantalapiedra Benjumea, Juan, to Metallgesellschaft Aktiengesellschaft. Method of and apparatus for the liquid contact of dust from a hot-gas stream and drying sludge. 4,093,426, Cl. 55-8.000.

Canter, George G. Car seal. 4,093,287, Cl. 292-317.000.

Cantor, Abraham: *See—*
Winicov, Murray W.; and Cantor, Abraham, 4,093,744, Cl. 424-333.000.

Capps, Overton B.; and Milliken, J. Richard, to Edgewater Steel Company. Articulated railway service wheel and unitary railway hub and axle. 4,093,299, Cl. 295-14.000.

Cardd, Inc.: *See—*
Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., 4,093,451, Cl. 75-43.000.

Cardwell, Paul H.; and Kane, William S., to Deepsea Ventures, Inc. Process for the simultaneous extraction of metal values from manganese nodules. 4,093,698, Cl. 423-24.000.

Carl Schenck AG, Firma: *See—*
Maus, Otfrid, 4,093,311, Cl. 301-9.0DH.

Carl Schleicher & Schull: *See—*
Hein, Wolfgang; and Grundmann, Peter, 4,093,108, Cl. 222-401.000.

Carr, Merle E., to United States of America, Agriculture. Xanthated starch amine paper additives. 4,093,510, Cl. 162-175.000.

Carrigan, Erwin R., to Emerson Electric Co. Seal for self-aligning bearing. 4,093,324, Cl. 308-187.100.

Carrington, Julian Lesco, III: *See—*
Blalock, Donald Raeford; and Carrington, Julian Lesco, III, 4,093,480, Cl. 156-54.000.

Carter, Christopher Frederick; Blunt, Roy Trevor; Lewis, James Cyril Alexander; and Garner, Geoffrey Michael, to Plessey Handel und Investments AG. Working fluids for electrophoretic image display devices. 4,093,534, Cl. 350-355.000.

Carter, John W.; and Koutsky, L. John, to Sears Manufacturing Company. Leaf spring suspension. 4,093,197, Cl. 267-131.000.

Casad, Burton M.: *See—*
Oertle, Donald H.; Vennett, Richard M.; Casad, Burton M.; and Radd, Fred J., 4,092,844, Cl. 73-23.000.

Case, Thomas L., to Midland-Ross Corporation. Furnace heating apparatus. 4,093,816, Cl. 13-2.00R.

Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., to Cardd, Inc. Coke agglomerate and method of utilizing same. 4,093,451, Cl. 75-43.000.

Cassidy, John E.; and Kraus, Max H., to Electro-Nite Co. Composite high temperature protection tube. 4,093,193, Cl. 266-87.000.

Castiaux, Marcel A. Pulverizer. 4,093,126, Cl. 241-37.500.

Castillo, Herman B.; and Mueller, Robert S., to Eaton Corporation. Motorless carbonator. 4,093,681, Cl. 261-122.000.

Castrol Limited: *See—*
Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,093,554, Cl. 252-78.300.

Caterpillar Tractor Co.: *See—*
Campbell, John J., 4,092,878, Cl. 74-801.000.
Curley, Francis M.; and Schmitt, James L., 4,093,034, Cl. 180-53.00R.
Habiger, Cyril W.; and Robinson, Tom E., 4,093,092, Cl. 214-674.000.
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,093,048, Cl. 192-13.00R.
Kinney, Lionel L., 4,092,855, Cl. 73-134.000.
Moring, Rodger L., 4,092,772, Cl. 29-434.000.
Muntjanoff, John Richard; and Lamport, Ivan Richard, 4,093,241, Cl. 277-24.000.
Stedman, Robert N., 4,093,259, Cl. 280-755.000.

Cavanagh, Robert B., Jr.; and Jan, David K., to United Technologies Corporation. Seal for variable plug two dimensional nozzle. 4,093,157, Cl. 244-53.00R.

Celanese Corporation: *See—*
Gordon, Marvin; Hannon, Martin J.; and George, Henry H., Jr., 4,093,571, Cl. 260-2.50B.
Soehngen, John W.; and Gerken, Albert, 4,093,404, Cl. 417-317.000.

Celanese Polymer Specialties Company: *See—*
Anderson, Terry L., 4,093,594, Cl. 260-47.0EP.

Ceskoslovanska akademie ved: *See—*
Kalal, Jaroslav; Zurkova, Eva; and Svec, Frantisek, 4,093,602, Cl. 260-73.00R.

Chambers, Alan F. Skate assembly. 4,093,249, Cl. 280-11.120.

Chambers, Clarence G., Jr., to Jayson Corporation. Sheet metal brake. 4,092,841, Cl. 72-320.000.

Champeaois, Michel Maurice Luce, to Produits Chimiques Ugine Kuhlmann. Copolymers of anthraquinone dyes and acrylamide. 4,093,793, Cl. 526-221.000.

Champion International Corporation: *See—*
Hain, Paul O., 4,093,422, Cl. 23-284.000.

Champion Products Inc.: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,093,753, Cl. 427-21.000.

Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. 6(6-Substituted-2,5,7,8-tetramethyl-2-chromanyl)-3-methyl hexanol derivatives. 4,093,632, Cl. 260-345.500.

Chang, Chin H.: *See*—
Maas, Edward T., Jr.; Longo, John M.; and Chang, Chin H., 4,093,783, Cl. 429-5.000.
Chang, Wen-Hsuan; Dowbenko, Rostyslaw; Hartman, Marvis E.; and Porter, Samuel, Jr., to PPG Industries, Inc. Coating compositions composed of hydroxyfunctional polymers or copolymers and alkoxysilanes. 4,093,673, Cl. 260-824.0EP.
Chas. Olson & Sons and Wheel Service Co., Inc.: *See*—
Nelson, Eldrid W., 4,093,303, Cl. 296-65.00R.
Charlton, Thomas. Bracing device. 4,092,933, Cl. 105-366.00R.
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to Thomson-CSF. Symmetrical time division matrix and a network equipped with this kind of matrix. 4,093,827, Cl. 179-15.0AT.
Chemische Fabrik Stockhausen & Cie: *See*—
Dahmen, Kurt; Hubner, Wolfgang; and Barthell, Eduard, 4,093,542, Cl. 210-54.000.
Chen, Augustin T.; and Onder, Kemal B., to Upjohn Company, The. Copolymers of polyparabanic acids and polyamides. 4,093,604, Cl. 260-77.5CH.
Chen, Thomas T., to Rockwell International Corporation. Magnetic bubble data transfer switch. 4,094,005, Cl. 365-16.000.
Cheng, Paul J.: *See*—
Kraus, Gerard; Stacy, Carl J.; and Cheng, Paul J., 4,093,705, Cl. 423-450.000.
Chernov, Jury Alexandrovich: *See*—
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.
Cherry, Carl James, to Combustion Engineering, Inc. Alumina refractories. 4,093,470, Cl. 106-56.000.
Chester, Arthur W.: *See*—
Kerr, George T.; and Chester, Arthur W., 4,093,560, Cl. 252-455.00Z.
Chevron Research Company: *See*—
Egan, Clark J., 4,092,825, Cl. 60-39.020.
Gomaa, Ezzat E., 4,093,027, Cl. 166-272.000.
Chibnik, Sheldon; and Otto, Ferdinand P., to Mobil Oil Corporation. Metal complexes of nitrogen compounds. 4,093,614, Cl. 260-299.000.
Chicago Dryer Company: *See*—
Kober, Kasimir, 4,093,205, Cl. 270-66.000.
Chippaux, Andre, to Plastimer. Process for the polymerization of vinyl chloride. 4,093,794, Cl. 526-344.000.
Choi, Nam Sok; and Heller, Jorge, to Alza Corporation. Drug delivery devices manufactured from poly(orthoesters) and poly(orthocarbonates). 4,093,709, Cl. 424-19.000.
Christensen, Inc.: *See*—
Jurgens, Rainer; and Ostertag, Alfred, 4,092,881, Cl. 81-57.340.
Christiana, William R.; and Hevesi, Joseph F., to International Business Machines Corporation. Method of winding a magnetic deflection yoke. 4,093,132, Cl. 242-7.030.
Christie, Alvin Benson; and Correll, Ronald Eugene, to Tektronix, Inc. Traveling wave deflector for electron beams. 4,093,891, Cl. 315-3.000.
Christie, John S., Jr.; Jenkins, S. Upton; and McConnell, George B., to Hunter Associates Laboratory, Inc. Spectrophotometer-digital data processing system for appearance measurements providing fast and accurate standardization, ease of use for different appearance measurements and fast response. 4,093,991, Cl. 364-525.000.
Chu, Bing-Lun; Subbarao, Wunnava Venkata; Peale, Jack; McCune, Kent; and Steiner, Marvin Elroy, to Burroughs Corporation. D-I-P On island. 4,093,971, Cl. 361-382.000.
Chu, Simon L.; and Golda, Eugene, to Polychrome Corporation. Photosensitive diazo condensate compositions. 4,093,465, Cl. 96-115.00R.
Chu, Wesley W. Statistical multiplexing system for computer communications. 4,093,823, Cl. 179-15.0BA.
Ciba Geigy AG: *See*—
Defago, Raymond; and Koci, Zdenek, 4,093,415, Cl. 8-2.50A.
Randell, Donald Richard; and Pickles, Wilfred, 4,093,680, Cl. 260-966.000.
Rump, Bjorn Sigurd; and Dereux, Philippe Jean, 4,093,416, Cl. 8-2.50A.
Ciba-Geigy Corporation: *See*—
Habermeier, Jurgen; and Berner, Godwin, 4,093,639, Cl. 260-429.900.
Hall, Luther A. R.; and Gordon, David A., 4,093,809, Cl. 548-308.000.
Hari, Stefan; and Roueche, Armand, 4,093,613, Cl. 260-154.000.
Hubele, Adolf, 4,093,738, Cl. 424-309.000.
Spivack, John D., 4,093,587, Cl. 260-45.8NE.
Spivack, John D.; and Dexter, Martin, 4,093,588, Cl. 260-45.80R.
Spivack, John D.; and Dexter, Martin, 4,093,618, Cl. 544-387.000.
Stephen, John F., 4,093,586, Cl. 260-45.80N.
Zwahlen, Gunther; Umsonst, Gerhard; and Laely, Andreas, 4,093,584, Cl. 260-40.00P.
Cincinnati Milacron Inc.: *See*—
Grove, George Luther, 4,092,807, Cl. 51-168.000.
Citizen Watch Company Limited: *See*—
Kume, Kazunari; Watanabe, Minoru; Oono, Hideshi; and Tamaru, Munetaka, 4,092,820, Cl. 58-23.00R.
Clapot, Claude; Vial, Jean; and Dumont, Louis, to PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques. Hydantoin derivatives and methods for regulating plant-growth. 4,093,444, Cl. 71-92.000.
Clare, Norval D.; and Lemke, Charles H., to Du Pont de Nemours, E. I., and Company. Process and reactor for making magnesium metal. 4,093,194, Cl. 266-122.000.
Clark Equipment Company: *See*—
Hansen, Howard C., 4,092,997, Cl. 137-351.000.
Polashak, Gerald L., 4,092,770, Cl. 29-263.000.
Clasen, Carl P.: *See*—
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.
Clavin, Edward A., to Midcon Pipeline Equipment Co. Traveling support apparatus. 4,092,928, Cl. 104-119.000.
Clemens, Richard P.; and Fuchs, Robert. Method of replacing hair. 4,092,739, Cl. 3-1.000.
Clews, David George; and Sweeting, David, to Elliott Brothers (London) Limited. Airplane instrument with throttle control selectively regulated by air speed or lift. 4,093,158, Cl. 244-182.000.
Clough, Roy L., Jr. Musical slide. 4,092,894, Cl. 84-319.000.
Clupak, Inc.: *See*—
Groome, Ernest J., 4,092,917, Cl. 100-176.000.
Coal Industry (Patents) Ltd.: *See*—
Mullins, Rex, 4,093,309, Cl. 299-1.000.
Coate, David W.: *See*—
Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., 4,093,451, Cl. 75-43.000.
Coca-Cola Company, The: *See*—
Mitchell, Charles Ronald; and Sedam, Jason K., 4,093,066, Cl. 198-861.000.
Coe, Paul L., Jr., to United States of America, National Aeronautics and Space Administration. Supersonic transport. 4,093,156, Cl. 244-45.00A.
Coffen, David Llewellyn, to Hoffmann-La Roche Inc. Production of pyridoxine intermediates from diketene. 4,093,654, Cl. 260-561.00A.
Coil Tite, Inc.: *See*—
Garrett, Richard H., Sr.; and Feniger, Yale M., 4,093,141, Cl. 242-56.900.
Coin Acceptors, Inc.: *See*—
Dietz, Kristen H., 4,093,057, Cl. 194-1.00R.
Coker, Charles Milton; and Kling, Gary Marvin, to Paramount Health Equipment Corp. Variable resistance lifting mechanism. 4,093,213, Cl. 272-118.000.
Coker, Charles Milton; and Coker, Cliff James, to Paramount Health Equipment Corp. Dual function exercise machine. 4,093,214, Cl. 272-118.000.
Coker, Cliff James: *See*—
Coker, Charles Milton; and Coker, Cliff James, 4,093,214, Cl. 272-118.000.
Coleman, John Douglas, to Commonwealth Scientific and Industrial Research Organization. Curtain coating method and apparatus and the manufacture of paperboard. 4,093,016, Cl. 162-124.000.
Colgate-Palmolive Company: *See*—
Steltenkamp, Robert John, 4,093,565, Cl. 252-522.000.
Collette, Robert P., to GTE Sylvania Incorporated. Assymetric top-bottom pincushion correction circuit. 4,093,895, Cl. 315-371.000.
Collier, Donald W.; Hoppesch, Joseph P.; and Mamo, Anthony C. Breath testing system. 4,093,945, Cl. 340-279.000.
Collins, Joseph C., to Sterling Drug, Inc. Methylenedioxyphenyl substituted aliphatic diketones. 4,093,736, Cl. 424-282.000.
Colombani, Bruno, to Industrie Pirelli S.p.A. Apparatus for removing a tire from a building drum of a tire building machine. 4,093,495, Cl. 156-394.000.
Color Custom Compounding, Inc.: *See*—
Danko, Edward M., 4,093,773, Cl. 428-365.000.
Combroux, Jean: *See*—
Schirmann, Jean Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 4,093,656, Cl. 260-566.00B.
Combustion Engineering, Inc.: *See*—
Cherry, Carl James, 4,093,470, Cl. 106-56.000.
Combustion Unlimited Incorporated: *See*—
Straitz, John F., III, 4,092,908, Cl. 98-60.000.
Comitato Nazionale per l'Energia Nucleare — Cnen: *See*—
Prodi, Vittorio; Melandri, Carlo; Tarroni, Giuseppe; Formignani, Massimo; De Zaiacomo, Tonino; and Bompane, Gianfranco, 4,092,845, Cl. 73-28.000.
Commercial Resins Company: *See*—
Hart, Robert J., 4,092,950, Cl. 118-8.000.
Commissariat a l'Energie Atomique: *See*—
Barraud, Andre; Gras, Roger; and Vandevyver, Michel, 4,093,757, Cl. 427-434.00A.
Farcy, Jean-Claude, 4,093,924, Cl. 330-4.300.
Henein, Kamal Labib; and Goursky, Vsevolod, 4,093,876, Cl. 307-264.000.
Commons, Thomas J.; Sheehan, John C.; and Lo, Young-Sek, to Massachusetts Institute of Technology. 6-Sulfur analogs of penicillins and cephalosporins. 4,093,625, Cl. 260-306.70C.
Commonwealth Scientific and Industrial Research Organization: *See*—
Coleman, John Douglas, 4,093,016, Cl. 162-124.000.
Compton, John William; and Eisenstein, Stephen Ellis, to BASF Wyandotte Corporation. Method of spotting garments to be laundered. 4,093,418, Cl. 8-142.000.
Cond, Frederick George, to Ibstock Building Products Limited. Production of surfacing units. 4,093,685, Cl. 264-28.000.

Condon, Michael E.: *See—*
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,093,814, Cl. 560-139.000.
Connor, Peter J., to Mosser Industries, Inc. Mechanical sealing means. 4,093,245, Cl. 277-237.00R.
Connors, Charles W.: *See—*
Reven, Frederick V.; and Connors, Charles W., 4,093,778, Cl. 428-411.000.
Contastin, Andre, to Industries et Techniques d'Ameublement. Mold-locking device. 4,093,176, Cl. 249-167.000.
Conti, Vincenzo: *See—*
Piccinini, Carlo; and Conti, Vincenzo, 4,093,541, Cl. 210-40.000.
Continental Oil Company: *See—*
Oertle, Donald H.; Vennett, Richard M.; Casad, Burton M.; and Radd, Fred J., 4,092,844, Cl. 73-23.000.
Starks, Charles Masterson, 4,093,667, Cl. 568-766.000.
Contraves AG: *See—*
Kaufmann, Kurt, 4,092,880, Cl. 81-9.50A.
Contraves Goerz Corporation: *See—*
Burig, Robert G.; and McNally, Paul F., 4,093,904, Cl. 318-616.000.
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. 7β-[2-Etherified oximino-2-(thienyl-, furyl- or pyridylacetamido)] cephalosporins. 4,093,803, Cl. 544-27.000.
Cooper Industries, Inc.: *See—*
Ferguson, William C., 4,092,776, Cl. 30-253.000.
Stover, Fred Douglas; and Thatcher, George Carl, 4,092,968, Cl. 123-148.00E.
Cope, Geoffrey Wilton, to Dresser Industries, Inc. Rotary coupler. 4,093,079, Cl. 213-62.00A.
Corbach, Rainer; Steinke, Leo; Benedikt, Walter; and Jurinke, Rudolf, to Robert Bosch GmbH. Spark plug, particularly for internal combustion engines having composite center electrode. 4,093,887, Cl. 313-140.000.
Cordts, Howard P.; Navin, Robert F.; and Ross, R. Charles, to Freeman Chemical Corporation. Copper foil electrical laminate with reinforced plastics. 4,093,768, Cl. 428-287.000.
Corning Glass Works: *See—*
Boitel, Marius Charles; and Renault, Serge Andre Maurice, 4,093,468, Cl. 106-39.700.
Sanford, Leon M.; and Wu, Che-Kuang, 4,093,469, Cl. 106-53.000.
Correll, Ronald Eugene: *See—*
Christie, Alvin Benson; and Correll, Ronald Eugene, 4,093,891, Cl. 315-3.000.
Corrigan, Steven P.: *See—*
Beaton, Arthur L.; and Weygant, Nelson E., 4,092,962, Cl. 123-133.000.
Costantini, Michel: *See—*
Bost, Pierre-Etienne; and Costantini, Michel, 4,093,636, Cl. 260-348.290.
Coughenour, Donald Jay; and Herr, John Addison, to Singer Company, The. Sewing machine with programmable memory. 4,092,938, Cl. 112-158.00E.
Coulon, Jean-Claude; and Amannati, Piero, to Saint Gobain Industries. Method and apparatus for manufacturing glass ribbon on a bath of molten metal. 4,093,439, Cl. 65-65.000.
Coval, Myer Louis. Method of producing intravenously injectable gamma globulin and a gamma globulin suitable for carrying out the method. 4,093,606, Cl. 260-112.00B.
Cowan, Stanley Wray: *See—*
Altland, Henry Wolf; Cowan, Stanley Wray; and Olivares, Ismael Adolfo, 4,093,462, Cl. 96-66.0HD.
Crane, Robert H., to Sparton Corporation. Conveyor packing station. 4,093,064, Cl. 198-485.000.
Creusot-Loire: *See—*
Sprunck, Emile; and Leroy, Pierre Jean, 4,093,190, Cl. 266-47.000.
Crick, Aubrey M., to International Standard Electric Corporation. Optical fiber connector. 4,093,341, Cl. 350-96.210.
Crnojevich, Ranko P.: *See—*
Blanco, Jorge L.; Crnojevich, Ranko P.; and Simons, Courtney S., 4,093,526, Cl. 204-104.000.
Crooks, Thomas Lee: *See—*
Bodner, Ronald Eugene; Crooks, Thomas Lee; and Kiscaden, Richard Craig, 4,093,986, Cl. 364-200.000.
Crosfield Electronics Limited: *See—*
Aughton, John E., 4,093,964, Cl. 358-302.000.
Cross, Peter Stanley, to Bell Telephone Laboratories, Incorporated. Method and apparatus for fabricating optical waveguide grating resonators. 4,093,339, Cl. 350-3.700.
Crown Cork & Seal Company, Inc.: *See—*
Balordi, Romano, 4,092,949, Cl. 118-6.000.
Crowther, John Cooper: *See—*
Renton, Stanley; and Crowther, John Cooper, 4,093,521, Cl. 204-43.00R.
Cruthers, Larry R.: *See—*
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,093,732, Cl. 424-273.00R.
Crystal Systems, Inc.: *See—*
Schmid, Frederick, 4,092,972, Cl. 125-16.00R.
Cullis, Herbert M., to Baxter Travenol Laboratories, Inc. Method and apparatus for determining the amount of ultrafiltration during dialysis. 4,093,545, Cl. 210-86.000.
Cummins Engine Company, Inc.: *See—*
Perr, Julius P., 4,093,046, Cl. 188-273.000.
Cunningham, Hugh, to PPG Industries, Inc. Method of preventing hydrogen deterioration in a bipolar electrolyzer. 4,093,525, Cl. 204-98.000.
Cunningham, Patrick J., to Dyne Corporation. Precision drive mechanism for converting fixed reciprocating motion to adjustable reciprocating motion. 4,092,871, Cl. 74-40.000.
Curley, Francis M.; and Schmitt, James L., to Caterpillar Tractor Co. Vehicle supported winch. 4,093,034, Cl. 180-53.00R.
Currie, Robert M., to Ford Motor Company. Method of making laminated windshields. 4,093,438, Cl. 65-62.000.
Cutler-Hammer, Inc.: *See—*
Karnowski, Thomas A.; and Shawaluk, Michael W., 4,093,850, Cl. 235-92.0TF.
Cybulska, Barbara: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.
D. L. Auld Company, The: *See—*
Waugh, Robert E., 4,092,953, Cl. 118-642.000.
Dahl, Michael M.; and Erb, Lester D., to Gates Rubber Company, The. Method for making a liquid heat exchanger coating. 4,093,755, Cl. 427-299.000.
Dahmen, Kurt; Hubner, Wolfgang; and Barthell, Eduard, to Chemische Fabrik Stockhausen & Cie. Flocculating agent comprising water-in-oil emulsion of H-active polymer carrying formaldehyde and amine radicals. 4,093,542, Cl. 210-54.000.
Daihatsu Kogyo Kabushiki Kaisha: *See—*
Ono, Junichi; Shimoura, Akira; and Tanaka, Yukiyasu, 4,092,969, Cl. 123-191.00S.
Daimler-Benz Aktiengesellschaft: *See—*
Burckhardt, Manfred H., 4,093,313, Cl. 303-6.00C.
Lehr, Josef, 4,093,253, Cl. 280-789.000.
Meyer, Ernst; Trube, Hans; and Grimm, Hermann, 4,092,907, Cl. 98-40.00A.
Scholz, Hansjurgen; Gimbel, Jurgen; and Jahn, Walter, 4,093,274, Cl. 280-747.000.
Wilfert, Karl; and Schmid, Walter, 4,093,255, Cl. 280-788.000.
Wulf, Helmut; and Niemann, Klaus, 4,092,931, Cl. 104-247.000.
Daly, Lewis J., to Stevens, Robert C.; and Loftus, John M. Diving apparatus. 4,093,209, Cl. 272-66.000.
Damen, Theodoor Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, to Bell Telephone Laboratories, Incorporated. Infrared polarization rotator and optical switch. 4,093,344, Cl. 350-147.000.
Damon, Lloyd E.: *See—*
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,093,474, Cl. 148-2.000.
Dana Corporation: *See—*
Johns, Marvin D., 4,093,054, Cl. 192-106.100.
Rubrich, Lawrence M., 4,092,999, Cl. 137-504.000.
Danfoss A/S: *See—*
Molin, Neil Leroy, 4,093,038, Cl. 180-82.00R.
Danko, Edward M., to Color Custom Compounding, Inc. Finishing welt, and method and apparatus for forming finishing welts. 4,093,773, Cl. 428-365.000.
Darex Corporation: *See—*
Bernard, Arthur Alexander; and Bernard, Richard Allen, 4,093,247, Cl. 279-53.000.
Das, Pankaj K., to United States of America, Navy. Acousto-optic image scanner. 4,093,976, Cl. 358-53.000.
Das, Santanu, to North Electric Company. Memory sparing arrangement. 4,093,985, Cl. 364-200.000.
Dash, Glen R., to Massachusetts Institute of Technology. Simulated video game. 4,093,221, Cl. 273-85.00G.
Dashner, Richard F.; and Bouchey, George J., to General Electric Company. Silicone glazing system. 4,092,812, Cl. 52-309.300.
Datametrics Corporation: *See—*
Walker, John A.; and Dimitri, Dimitri S., 4,093,847, Cl. 219-501.000.
David, Thomas, to Ludwig Bertram GmbH & Co. KG, Firma. Prosthetic device for use as a hip joint. 4,092,741, Cl. 3-1.913.
Davidson, Hugh; Johnson, Keith Trevor; Leggeter, Brian Ernest; and Moore, Anthony John, to Hickson & Welch Limited. Styryl-tetrahydronaphthyl derivatives. 4,093,645, Cl. 260-505.00C.
Davis, Frank S.: *See—*
Wayland, James Robert, Jr.; Davis, Frank S.; and Merkle, Morris Guy, 4,092,800, Cl. 47-1.300.
Davis, Gregory A.; Krippner, Kenneth E.; Roestel, Jan A.; Vonk, Gottfried; and Zacher, Albert R., Jr., to Artronix, Inc. Axial tomographic apparatus. 4,093,859, Cl. 250-445.00T.
Davis, John Brian; Skilling, Derek; and Wrigley, Nigel Edwin, to Imperial Chemical Industries Limited. Cooling thermoplastics tubes. 4,093,412, Cl. 425-71.000.
Davis, Paul; and Schneider, David, to Sweetheart Plastics, Inc. Food serving system. 4,093,041, Cl. 186-1.00D.
Davis, Philip S.: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,093,580, Cl. 260-29.6SQ.
Davis, Thomas Francis, to AMP Incorporated. Electroless tin and tin-lead alloy plating baths. 4,093,466, Cl. 106-1.220.
Davison, Thomas M.: *See—*
Brown, Lee Roy; and Davison, Thomas M., 4,093,955, Cl. 354-3.000.
Dayco Corporation: *See—*
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Browning, Vernon D., 4,093,694, Cl. 264-246.000.

Duckett, John C.; and Gaworowski, Andrew J., 4,093,764, Cl. 428-113.000.
Gaworowski, Andrew J.; and Easley, Wayne W., 4,093,487, Cl. 156-244.160.
Debe, A. Joseph. Bipartite stock certificate. 4,093,276, Cl. 283-1.00R.
de Brito Antunes, Carlos: *See*—
Kawamata, Tadahisa; Freire Antunes, Carlos Jorge; and de Brito Antunes, Carlos, 4,093,173, Cl. 249-105.000.
DeCarlo, Joseph P., to Foxboro Company, The. Oscillating wing flowmeter. 4,092,859, Cl. 73-194.00B.
Deck, Charles F.: *See*—
Weipert, Eugene A.; and Deck, Charles F., 4,093,676, Cl. 260-857.0PG.
Decker, Robert Anthony: *See*—
Bellas, Frederic Edward; and Decker, Robert Anthony, 4,092,809, Cl. 52-63.000.
DeCoene, Frans J. G. C., to Sperry Rand Corporation. Unloading tube arrangement for combine harvester grain tank. 4,093,087, Cl. 214-83.260.
Deepsea Ventures, Inc.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,093,698, Cl. 423-24.000.
Deere & Company: *See*—
Gebauer, Thomas Edward; and McMullen, Larry Gene, 4,092,837, Cl. 64-27.0NM.
Moore, James Walter; and Braun, Stephen Alphonse, 4,093,039, Cl. 181-229.000.
Schreiber, Larry Donald, 4,092,904, Cl. 91-395.000.
Trumbauer, David V., 4,093,018, Cl. 164-32.000.
Defago, Raymond; and Koci, Zdenek, to Ciba Geigy AG. Transfer printing process for hydrophilic, synthetic fibre material or mixtures of hydrophilic and synthetic fibre material. 4,093,415, Cl. 8-2.50A.
Dehler, Juergen: *See*—
Reiss, Wolfgang; Joschek, Hans-Ingo; Schnur, Rudolf; Winderl, Siegfried; Dehler, Juergen; and Hoffmann, Herwig, 4,093,668, Cl. 568-855.000.
De Jong, Eduard: *See*—
Raabe, Fritz; and De Jong, Eduard, 4,093,492, Cl. 156-331.000.
Dekker, Frank: *See*—
Shroff, Bansi K.; Dekker, Frank; and Nordrehaug, John, 4,093,149, Cl. 242-198.000.
DeLapp, Darwin Fiske; Goebel, James Christopher; and Bunkowski, Kenneth Dana, to Formica Corporation. Low pressure melamine resins containing an ethylene glycol and an elastomer. 4,093,579, Cl. 260-29.40R.
Delavarenne, Serge Yvon: *See*—
Schirmann, Jean Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 4,093,656, Cl. 260-566.00B.
Della Torre, Edward: *See*—
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de Maat, Johannes Augustinus Catharinus Maria: *See*—
Arts, Matheus Gijsbertus Jozef; Spaan, Jozef Augustinus Elisabeth; v. Asseldonk, Antonius Gerardus Martinus; and de Maat, Johannes Augustinus Catharinus Maria, 4,092,860, Cl. 73-304.00R.
Demole, Edouard P., to Firmenich S.A. Aromatic compositions. 4,092,989, Cl. 131-17.00R.
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, to Sogemaric. Solid phytosanitary composition. 4,093,440, Cl. 71-65.000.
Dennison Manufacturing Company: *See*—
Joyce, Arthur W., 4,092,765, Cl. 24-16.0PB.
Denny, Dann W., to General Electric Company. Circuit and method for controlling speed of an alternating current motor. 4,093,899, Cl. 318-227.000.
Deraedt, Roger: *See*—
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,093,724, Cl. 424-250.000.
Dereux, Philippe Jean: *See*—
Rump, Bjorn Sigurd; and Dereux, Philippe Jean, 4,093,416, Cl. 8-2.50A.
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Wood, Donald C.; and McLaughlin, Robert L., 4,093,745, Cl. 424-358.000.
Detwiler Corporation: *See*—
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Detwiler, John H., to Detwiler Corporation. Skid preventive tire assembly. 4,093,012, Cl. 152-226.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Fahnenstich, Rudolf; Heese, Joachim; and Lewis, Dyfed, 4,093,740, Cl. 424-319.000.
Devalois, Serge: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,093,553, Cl. 252-70.000.
deWijn, Joost Robert, to Sulzer Brothers, Ltd. Mixture for anchoring bone implants. 4,093,576, Cl. 260-17.00R.
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Spivack, John D.; and Dexter, Martin, 4,093,588, Cl. 260-45.80R.
Spivack, John D.; and Dexter, Martin, 4,093,618, Cl. 544-387.000.
De Zaiacomo, Tonino: *See*—
Prodi, Vittorio; Melandri, Carlo; Tarroni, Giuseppe; Formignani, Massimo; De Zaiacomo, Tonino; and Bompane, Gianfranco, 4,092,845, Cl. 73-28.000.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof in the treatment of pain, fever or inflammation. 4,093,737, Cl. 424-304.000.
Diamond Shamrock Corporation: *See*—
Babinsky, Andrew D.; and Benezra, Leo L., 4,093,531, Cl. 204-265.000.
Szur, Alex J., 4,093,775, Cl. 428-394.000.
Dickson, Thomas David, Jr.; and Wright, Jeremy Corwin, to Alza Corporation. Fiber bundle encapsulating apparatus. 4,092,769, Cl. 29-234.000.
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, to BASF Aktiengesellschaft. Process and apparatus for drying and heating nylon granules. 4,092,784, Cl. 34-13.000.
Dietz, Kristen H., to Coin Acceptors, Inc. Gate assembly for a coin selecting and separating device. 4,093,057, Cl. 194-1.00R.
Dietze, Wolfgang; Mittermeier, Richard; and Steinwagner, Gerhard, to Siemens Aktiengesellschaft. Disc support structure. 4,093,201, Cl. 269-296.000.
Dillenberg, Horst. Electrolytic chromic acid bath for chrome plating. 4,093,522, Cl. 204-51.000.
Dills, Raymond L., to General Electric Company. Low-temperature slow-cooking microwave oven. 4,093,841, Cl. 219-10.55E.
Dimitri, Dimitri S.: *See*—
Walker, John A.; and Dimitri, Dimitri S., 4,093,847, Cl. 219-501.000.
Dimyan, Magid Yousri, to Burroughs Corporation. Gapless magnetic bubble expander-detector circuit. 4,094,004, Cl. 365-8.000.
Dimyan, Magid Yousri, to Burroughs Corporation. Gapless magnetic bubble propagation circuit. 4,094,006, Cl. 365-39.000.
Dionne, Joseph Guy Gilles: *See*—
Olive, Graham; Lake, Royston Ernest Walter; and Dionne, Joseph Guy Gilles, 4,093,852, Cl. 250-213.00A.
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Dmitrievsky, Vladimir Sergeevich: *See*—
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Dobberphul, Daniel W.: *See*—
Watrous, Donald L.; and Dobberphul, Daniel W., 4,093,909, Cl. 323-22.00R.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Pries, Erich, 4,093,519, Cl. 202-241.000.
Dr. Ing. h.c.F.Porsche Aktiengesellschaft: *See*—
Ziegler, Hermann, 4,093,304, Cl. 296-84.00D.
Dokoupil, Ludvik; Hrouda, Oldrich; and Zila, Josef, to Zavody presneho strojirenstvi, narodni podnik. Apparatus for the identification of size numbers of right and left lasts. 4,092,757, Cl. 12-127.000.
Donaghy, Robert E., to General Electric Company. Process for electroless deposition of metals on zirconium materials. 4,093,756, Cl. 427-304.000.
Donahue, Carroll F. Method for forming a clevis. 4,092,773, Cl. 29-512.000.
Donovan Construction Company: *See*—
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Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Process for preparing trihydrocarbyl (2,5-dihydroxyphenyl) phosphonium salts. 4,093,650, Cl. 260-539.00A.
Double, Glen P.; Kahwaty, Vincent N.; Randall, James D.; and Reinhart, Fritz M., to International Business Machines Corporation. NMR magnet assembly with pole face parallelism adjustment. 4,093,912, Cl. 324-.5MA.
Dougan, Thomas P., to Upjohn Company, The. Fire retardant box spring and mattress. 4,092,752, Cl. 5-345.00R.
Dow Chemical Company, The: *See*—
Beaver, Richard N.; and Becker, Charles W., 4,093,533, Cl. 204-296.000.
Britton, Thomas C.; and Trepanier, Donald L., 4,093,805, Cl. 544-116.000.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,093,644, Cl. 260-465.00F.
Doorakian, George A.; and Duquette, Lawrence G., 4,093,650, Cl. 260-539.00A.
Ham, George E.; and Krause, Ruben L., 4,093,615, Cl. 260-239.0BC.
Harris, Robert F.; and Wagener, Earl H., 4,093,663, Cl. 260-607.00B.
Sun, Yun Chung, 4,093,672, Cl. 260-674.00R.
Dow Corning Corporation: *See*—
Plueddemann, Edwin P., 4,093,641, Cl. 260-448.20E.
Dowbenko, Rostyslaw: *See*—
Chang, Wen-Hsuan; Dowbenko, Rostyslaw; Hartman, Marvis E.; and Porter, Samuel, Jr., 4,093,673, Cl. 260-824.0EP.
Doyle, Barry N.; Seibt, Willie H.; Sarkar, Kshitindra Mohan; and Benz, Mark R., to Sherritt Gordon Mines Limited. Production of ultrafine cobalt powder from dilute solution. 4,093,450, Cl. 75-0.5AA.
Drablowski, William J.: *See*—
Schoenherr, Leonard H.; and Drablowski, William J., 4,092,801, Cl. 47-41.120.
Draxler, James Richard, to Brunswick Corporation. Permanent magnet pulse generator and method of forming and assembly. 4,093,906, Cl. 322-51.000.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 4,093,079, Cl. 213-62.00A.

Dreyfus, Gerard; and Lewiner, Jacques, to Agence Nationale de Valorisation de la Recherche (ANVAR). Thin structures having a piezoelectric effect, devices equipped with such structures and in their methods of manufacture. 4,093,884, Cl. 310-328.000.

Driscoll, Joseph R., to United States of America, Army. Lithium primary cell. 4,093,784, Cl. 429-101.000.

Droz, Willy; and Beguin, Jean-Luc, to Ebauches SA. Control device for an electronic wrist-watch. 4,092,822, Cl. 58-23.00R.

Drozd, Charles J.: *See—*
Paschal, James P.; Nickel, Donald F.; and Drozd, Charles J., 4,093,878, Cl. 307-291.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Process for the preparation of thiosulfenyl carbamoyl halides. 4,093,652, Cl. 260-544.00C.

DSO "Bulgarplod": *See—*
Genchev, Lyubomir Nikolov; Kafedjiev, Iliya Chudomirov; and Klyamov, Kostadin Spirov, 4,092,910, Cl. 99-472.000.

Dual Gebruder Steidinger: *See—*
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Dubovik, Alexandr Ivanovich: *See—*
Suslin, Vladimir Isaakovich; Dubovik, Alexandr Ivanovich; Makeev, Boris Anatolievich; Razdymakha, Pavel Semenovich; and Lekarev, Zinovy Abramovich, 4,093,530, Cl. 204-224.00M.

Duckett, John C.; and Gaworowski, Andrew J., to Dayco Corporation. Compressible printing blanket. 4,093,764, Cl. 428-113.000.

Dufaylite Developments Limited: *See—*
Thwaites, Peter John; and Green, Dennis William, 4,093,818, Cl. 174-48.000.

Dumont, Louis: *See—*
Clapot, Claude; Vial, Jean; and Dumont, Louis, 4,093,444, Cl. 71-92.000.

Dunn, Ronald Lee. Pool table construction and its method of construction. 4,093,216, Cl. 273-6.000.

Du Pont de Nemours, E. I., and Company: *See—*
Apotheker, David, 4,093,583, Cl. 260-33.6AQ.
Clare, Norval D.; and Lemke, Charles H., 4,093,194, Cl. 266-122.000.
Elliott, Steven P., 4,093,595, Cl. 260-47.00C.

Duquette, Lawrence G.: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 4,093,650, Cl. 260-539.00A.

Durant, Graham John; Ganellin, Charon Robin; and Owen, Geoffrey Robert, to Smith Kline & French Laboratories Limited. N-Oxy and N-amino guanidines. 4,093,729, Cl. 424-270.000.

Durant, Graham John: *See—*
Brown, Thomas Henry; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,093,621, Cl. 260-294.80H.

Durenec, Peter, to United States of America, Army. Balanced compressor. 4,092,829, Cl. 60-517.000.

Durenec, Peter, to United States of America, Army. Split-phase cooler with expansion piston motion enhancer. 4,092,833, Cl. 62-6.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Kern, Georg, 4,092,814, Cl. 52-730.000.

Dyne Corporation: *See—*
Cunningham, Patrick J., 4,092,871, Cl. 74-40.000.

Dziegielewska, Maria: *See—*
Augustyn, Wladyslaw; Dziegielewska, Maria; and Kossuth, Andrzej, 4,093,706, Cl. 423-490.000.

E. Allman and Company Limited: *See—*
Allman, Denis John; and Taylor, Lionel Ivor Alfred, 4,093,107, Cl. 222-23.000.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,093,801, Cl. 544-25.000.
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,093,814, Cl. 560-139.000.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,093,732, Cl. 424-273.00R.
Wade, Peter C.; and Kissick, Thomas P., 4,093,728, Cl. 424-269.000.

Earth Sciences, Inc.: *See—*
Loest, Kent W.; and Kesler, George H., 4,093,700, Cl. 423-120.000.

Easley, Wayne W.: *See—*
Gaworowski, Andrew J.; and Easley, Wayne W., 4,093,487, Cl. 156-244.160.

Eastman Kodak Company: *See—*
Altland, Henry Wolf; Cowan, Stanley Wray; and Olivares, Ismael Adolfo, 4,093,462, Cl. 96-66.0HD.
Fletcher, George Leland; and Mosehauer, Michael, 4,093,463, Cl. 96-67.000.
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,093,603, Cl. 260-75.00R.
Masurekar, Prakash S.; and Goodhue, Charles T., 4,093,517, Cl. 195-66.00R.
Schmitz, Alfons F.; and Dixon, Douglas L., 4,093,134, Cl. 242-18.0PW.
Welch, Richard D.; and Iversen, John E., 4,093,493, Cl. 156-358.000.

Eaton Corporation: *See—*
Castillo, Herman B.; and Mueller, Robert S., 4,093,681, Cl. 261-122.000.

Eaton, Manford Leslie. Resilient material which is electrically conductive under pressure. 4,093,563, Cl. 252-513.000.

Eaton, Milton, to General Electric Company. Multi-jet electrode boiler. 4,093,846, Cl. 219-286.000.

Ebauches SA: *See—*
Droz, Willy; and Beguin, Jean-Luc, 4,092,822, Cl. 58-23.00R.

Ebel, Fred H.: *See—*
Landgraf, Glenn A.; and Ebel, Fred H., 4,093,204, Cl. 270-21.000.

Eberhardt, Robert M.; McNana, James Arthur; and Heuer, Dennis M., to All States Plastic Manufacturing Co. Inc. Cable tie gun. 4,093,005, Cl. 140-123.600.

Eberline, Howard C.; and Moon, Jack L., to Kerr-McGee Corporation. Logging method and apparatus. 4,093,936, Cl. 340-18.0CM.

Eckhardt, Gisela; and Eckhardt, Wilfried O., to Hughes Aircraft Company. Liquid-metal plasma valve configurations. 4,093,888, Cl. 313-163.000.

Eckhardt, Wilfried O.: *See—*
Eckhardt, Gisela; and Eckhardt, Wilfried O., 4,093,888, Cl. 313-163.000.

Eckold, Gerd-Jurgen; and Maass, Hans, to Paweck AG. Device for flanging the edges of sheet sections. 4,092,840, Cl. 72-312.000.

Edgerton, Gene A., to United States of America, Navy. Oceanographic sensor with in-situ cleaning and bio-fouling prevention system. 4,092,858, Cl. 73-170.00A.

Edgewater Steel Company: *See—*
Capps, Overton B.; and Milliken, J. Richard, 4,093,299, Cl. 295-14.000.

Edmisten, John H. Method for identifying the load characteristics of a centerfire firearm cartridge. 4,092,924, Cl. 101-426.000.

Edwards, John W. Endless drive system. 4,093,318, Cl. 305-11.000.

Edwards, Robert Harry; Williams, Thomas Alan; and Hall, Kenneth. Ether phosphoric acid compound. 4,093,662, Cl. 260-606.50P.

Egan, Clark J., to Chevron Research Company. Process for base-load and peak-load power generation. 4,092,825, Cl. 60-39.020.

Eggen, Gerardus Theodorus Joseph. Method for manufacturing moulded plastic articles. 4,093,691, Cl. 264-93.000.

Eggert, Frank, to Schlegel (UK) Limited. Edge protector trim strip. 4,092,813, Cl. 52-397.000.

Eguchie, Yoshio: *See—*
Tsutsui, Koichi; and Eguchie, Yoshio, 4,093,674, Cl. 260-830.00P.

Eheim, Franz: *See—*
Hofer, Gerald; Eheim, Franz; and Kopse, Odon, 4,092,964, Cl. 123-139.0AT.

Ehrenreich Photo-Optical Industries, Inc.: *See—*
Weiner, Manfred, 4,093,379, Cl. 355-77.000.

Ehret, Urban: *See—*
Schollhorn, Wolfgang; and Ehret, Urban, 4,093,413, Cl. 425-110.000.

Eichorn, Roger H., deceased; by Lincoln First Bank of Rochester, executor; and Silverberg, Morton, to Xerox Corporation. Imaging apparatus. 4,093,367, Cl. 355-3.00R.

Eisai Co., Ltd.: *See—*
Akatsuka, Shin-Ichiro; Akutsu, Shozo; and Uchida, Michio, 4,093,748, Cl. 426-19.000.

Eisenstein, Stephen Ellis: *See—*
Compton, John William; and Eisenstein, Stephen Ellis, 4,093,418, Cl. 8-142.000.

Ekis, Robert W.: *See—*
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.

Electric Power Research Institute, Inc.: *See—*
Glenn, Robert G., 4,093,399, Cl. 416-95.000.

Electro-Nite Co.: *See—*
Cassidy, John E.; and Kraus, Max H., 4,093,193, Cl. 266-87.000.

Elektromekano i Bredaryd AB: *See—*
Larsson, Bertil Ivar, 4,093,163, Cl. 246-476.000.

Eli Lilly and Company: *See—*
Kukolja, Stjepan, 4,093,800, Cl. 544-16.000.
Shields, James E., 4,093,574, Cl. 260-8.000.

Eliseev, Stanislav Borisovich; Butskoi, Jury Alexandrovich; Dmitrievsky, Vladimir Sergeevich; Golubeva, Albina Andreevna; Ozerov, Vladimir Mikhailovich; Volkov, Valentin Stepanovich; and Vasninova-Shipulina, Iya Petrovna. Method of producing pellets from ore concentrates. 4,093,448, Cl. 75-3.000.

Ellendt, Gunther: *See—*
Knofel, Hartmut; and Ellendt, Gunther, 4,093,658, Cl. 260-570.00D.

Elliott Brothers (London) Limited: *See—*
Clews, David George; and Sweeting, David, 4,093,158, Cl. 244-182.000.

Elliott, Steven P., to Du Pont de Nemours, E. I., and Company. Process for preparing polyesters from diphenols and aromatic dicarboxylic acids by direct polymerization. 4,093,595, Cl. 260-47.00C.

Ellis, Donald G. Inflatable insulating apparatus. 4,092,750, Cl. 5-343.000.

Elmo Company, Limited: *See—*
Kato, Masakathu, 4,093,362, Cl. 352-27.000.

Eltra Corporation: *See—*
Miele, Raymond D., Jr.; and Watson, Roy E., 4,092,866, Cl. 73-431.000.

Emerson Electric Co.: *See—*
Carrigan, Erwin R., 4,093,324, Cl. 308-187.100.
Shirey, Robert D., 4,093,968, Cl. 361-58.000.

Emerson, Ralph Waldo; and Shattuck, John R., to Plasmine Corporation, The. Paper coated with ammonia-containing sizing compositions. 4,093,779, Cl. 428-411.000.

Emmett, John Colin: *See—*
Brown, Thomas Henry; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,093,621, Cl. 260-294.80H.

Envirotech Corporation: *See—*
Thomas, Arthur E.; and Pace, E. Alan, 4,092,764, Cl. 19-107.000.

Eppink, Donald L.: *See—*
Miller, John J., Jr.; Eppink, Donald L.; and Loxley, Ted A., 4,093,017, Cl. 164-28.000.

Epstein, Lawrence J. Apparatus for testing reflexes and/or for functioning as a combination lock. 4,093,870, Cl. 307-10.00R.

Erb, Darrell M.: *See—*
Hartman, John M.; and Erb, Darrell M., 4,093,872, Cl. 307-221.00D.

Erb, Lester D.: *See—*
Dahl, Michael M.; and Erb, Lester D., 4,093,755, Cl. 427-299.000.

Erb, Thomas L.: *See—*
Frank, Donald H.; Jeffries, J. Fred; Swanson, Mary C.; Erb, Thomas L.; and Hall, James D., 4,092,980, Cl. 128-2.00A.

Erickson, Charles E.; and Neogi, Amar N., to Precision Cosmet Co., Inc. Composite prosthetic polymeric devices. 4,093,361, Cl. 351-160.000.

Erickson, Gerald, to International Omni-Pak Corporation. Bottle carrier. 4,093,295, Cl. 294-87.200.

Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, to SKF Kugellagerfabriken GmbH. Sliding collar. 4,093,053, Cl. 192-98.000.

Erpenbeck, Paul J., to Breneman, Inc. Manual window shade roller cut off knife. 4,092,775, Cl. 30-95.000.

Ertl, John Paul. Method and apparatus for brain waveform examination. 4,092,981, Cl. 128-2.10B.

Erwin, Curtis L., Jr. Fuel measuring and recording systems for combustion devices and method for monitoring fuel flow. 4,092,850, Cl. 73-113.000.

Escher Wyss Limited: *See—*
Guyer, August, 4,093,552, Cl. 210-297.000.
Link, Christoph; and Stotz, Wolf-Gunter, 4,092,916, Cl. 100-174.000.

Escue, Jesse W. Stock winding apparatus. 4,093,143, Cl. 242-75.510.

Eshleman, Robert C. Miniaturized golf game. 4,093,222, Cl. 273-87.00R.

Eshriqui, Salomao. Articulated joint prosthesis. 4,092,740, Cl. 3-1.911.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,093,555, Cl. 252-188.30R.

Estes, Earl M., to American Technology Corporation. Test signal generating system and method. 4,093,960, Cl. 358-10.000.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,640, Cl. 260-429.900.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,806, Cl. 544-165.000.

Eszenyl, Ervin: *See—*
Mayer, Gyorgy; Gyori, Janos; Rikker, Mihaly; Banfai, Antal; and Eszenyl, Ervin, 4,093,689, Cl. 264-71.000.

Etablissements Nativelle S.A.: *See—*
Jarreau, Francois Xavier; and Koenig, Jean-Jacques, 4,093,619, Cl. 260-284.000.

Etablissements Tiflex Societe Anonyme: *See—*
Bousquet, Jacques, 4,092,890, Cl. 83-284.000.

Evans, Norol T., to Hughes Aircraft Company. Clutter tracker using a smoothed doppler frequency measurement. 4,093,949, Cl. 343-7.00A.

Evans, William C., to Viva-Tech Inc. Phase-controlled voltage regulator. 4,093,908, Cl. 323-19.000.

EVG Entwicklungs-u. Verwertungs Gesellschaft mbH: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,093,106, Cl. 221-224.000.

Ewers, Marion H., to Air Rotor Development Company, Inc. Patient handling system. 4,092,748, Cl. 5-85.000.

Ewy, Robert J.; and Moore, Robert P., to King Radio Corporation. Acceleration sensitive switch. 4,093,836, Cl. 200-61.530.

Extranuclear Laboratories, Inc.: *See—*
Fite, Wade L.; and Myers, Richard L., 4,093,855, Cl. 250-282.000.

Exxon Research and Engineering Company: *See—*
Ball, Gerald Stuart Morris; and Andrews, Anthony Walter, 4,092,970, Cl. 123-198.00D.
Maas, Edward T., Jr.; Longo, John M.; and Chang, Chin H., 4,093,783, Cl. 429-5.000.
Scher, Herbert I.; Lex, Joseph A.; and Ungar, Israel S., 4,093,766, Cl. 428-165.000.
Vannice, M. Albert; and Garten, Robert L., 4,093,643, Cl. 260-449.00M.

Ezaki, Toshi, to Toyoto Jidosha Kogyo K. K. Protective frame structure for a motor vehicle fuel tank. 4,093,254, Cl. 280-783.000.

Facet Enterprises, Inc.: *See—*
Giometti, Paul Francis, 4,092,870, Cl. 74-7.00R.

Factor, Arnold; Jaquiss, Donald Benjamin George; and Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,093,589, Cl. 260-45.75B.

Fahnenstich, Rudolf; Heese, Joachim; and Lewis, Dyfed, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessier. Fodder for ruminants. 4,093,740, Cl. 424-319.000.

Faivre, Andre: *See—*
Tanguy, Pierre; and Faivre, Andre, 4,092,835, Cl. 62-136.000.

Falk, Curt Gunnar, to Forenade Fabriksverken. Fluid actuated coupling assembly. 4,093,052, Cl. 192-88.00B.

Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, to Politechnika Gdanska. Antibiotic derivatives of polyene macrolide group and method of obtaining the same. 4,093,796, Cl. 536-17.000.

Fan, You-Ling; and Farnham, Alford Gailey, to Union Carbide Corporation. Silane end-capped polyarylene polyethers. 4,093,600, Cl. 260-49.000.

Farcy, Jean-Claude, to Commissariat a l'Energie Atomique. Device for applying a laser pulse delivered by a laser oscillator. 4,093,924, Cl. 330-4.300.

Farnham, Alford Gailey: *See—*
Fan, You-Ling; and Farnham, Alford Gailey, 4,093,600, Cl. 260-49.000.

Farrand Optical Co., Inc.: *See—*
La Russa, Joseph A., 4,093,347, Cl. 350-174.000.

Faulkingham, Clifford Henry. Flap positioning assembly. 4,093,112, Cl. 227-150.000.

Fayle, Paul R. Window lock. 4,093,285, Cl. 292-251.000.

Feichtinger, Gerhard: *See—*
List, Hans; Skatsche, Othmar; Greier, Josef; Obermayer, Bertram; Feichtinger, Gerhard; and Wagner, Johann, 4,092,956, Cl. 123-41.740.

Feil, Hendrik J.: *See—*
Ponjee, Johannes J.; and Feil, Hendrik J., 4,093,504, Cl. 156-656.000.

Feist, Wieland; Junghanns, Klaus; and Kunz, Alfred, to Jenoptik Jena G.m.b.H. Angle measuring device with a telescope. 4,093,383, Cl. 356-152.000.

Fellure, James Erwin; and Toth, Endre Leslie, to Arcair Company. Arc length measurement and control by optical scanning. 4,093,844, Cl. 219-124.020.

Feniger, Yale M.: *See—*
Garrett, Richard H., Sr.; and Feniger, Yale M., 4,093,141, Cl. 242-56.900.

Fenton, Alvin P., to Kohler Co. Magnetic armature piece for rotary solenoid. 4,093,931, Cl. 335-272.000.

Ferdinandi, Eckhardt: *See—*
Bagli, Jehan F.; and Ferdinandi, Eckhardt, 4,093,628, Cl. 260-326.12R.

Ferguson, Charles L. Safety device for welding torch. 4,093,191, Cl. 266-45.000.

Ferguson, Gerald D., to United States of America, Navy. Narrow angle, narrow bandwidth optical receiver system. 4,093,384, Cl. 356-186.000.

Ferguson, William C., to Cooper Industries, Inc. Cutting tool. 4,092,776, Cl. 30-253.000.

Fernholz, Hans; Roscher, Gunter; Schmidt, Hans-Joachim; Schmitz, Heinz; and Wunder, Friedrich, to Hoechst Aktiengesellschaft. Process for the preparation of a palladium catalyst. 4,093,559, Cl. 252-443.000.

Ferruti, Paolo; Martuscelli, Ezio; Riva, Fernando; and Provenzale, Luciano. Macromolecular materials suitable for forming antithrombogenic prosthesis and artificial organs and process for preparing same. 4,093,677, Cl. 260-858.000.

Fib-R-Fit Inc.: *See—*
Verdesca, Anthony Fredrick; and Borrajo, Orlando, 4,093,279, Cl. 285-23.000.

Fields, Larry D.: *See—*
Morris, Earl L.; and Fields, Larry D., 4,093,177, Cl. 251-54.000.

Finger, Gunther: *See—*
Hausberg, Gerhard; Hegemann, Karl-Rudolf; Finger, Gunther; Schafer, Hans; and Weissert, Helmut, 4,093,434, Cl. 55-226.000.

Firm Piel & Adey: *See—*
Seybold, Rolf; and Gross, Gerd, 4,093,019, Cl. 164-52.000.

Firmenich S.A.: *See—*
Demole, Edouard P., 4,092,989, Cl. 131-17.00R.

Fischer, Rudolf; and Frey, Rudolf, to Albert-Frankenthal AG. Device for slowing down printing specimen in the folding apparatus. 4,093,203, Cl. 270-20.000.

Fisher, Martin John, to British Hydromechanics Research Association, The. Slotted worktable. 4,092,889, Cl. 83-177.000.

Fisher, Michael H., to Merck & Co., Inc. Derivatives of antibiotic substance milbemycin and processes therefor. 4,093,629, Cl. 260-326.340.

Fisli, Tibor, to Xerox Corporation. System for centrifugally casting a thin film plastic in a replica process for providing multi-faceted polygonal scanners. 4,093,350, Cl. 350-299.000.

Fite, Wade L.; and Myers, Richard L., to Extranuclear Laboratories, Inc. Detector for heavy ions following mass analysis. 4,093,855, Cl. 250-282.000.

Fitzpatrick, John D.; and Smith, Gary L., to General Motors Corporation. Independent suspension system. 4,093,273, Cl. 280-696.000.

Fleischer, Helmut: *See—*
Schneider, Erich; Schnaibel, Eberhard; and Fleischer, Helmut, 4,092,853, Cl. 73-121.000.

Fleischer, Thomas B., to Huyck Corporation. Papermakers belts having ultra-high modulus load bearing yarns. 4,093,512, Cl. 162-348.000.

Fleischfresser, Marvin H.: *See—*
Miller, George A.; and Fleischfresser, Marvin H., 4,093,655, Cl. 260-564.0RF.

Fletcher, George Leland; and Mosehauer, Michael, to Eastman Kodak Company. Water soluble binder overcoat on vesicular element containing N_2-releasing agent. 4,093,463, Cl. 96-67.000.

Fletcher, Orval K. Fluid mill powered vehicle. 4,093,035, Cl. 180-65.0DD.

Fletchic, Donald K.: *See—*
Isaacson, Anson; Morrison, Howard J.; Baer, Ralph H.; Fletchic, Donald K.; and Keller, Albert G., 4,093,832, Cl. 179-100.40D.

Terzian, Rouben T.; and Fletchic, Donald K., 4,093,260, Cl. 280-240.000.

Fling, William F. Liquid level measuring device. 4,092,861, Cl. 73-311.000.

Flink, Joseph H.; and Bertrand, John, to Rockland Systems Corporation. Spectrum analyzer using digital filters. 4,093,989, Cl. 364-485.000.

Flint, John R.: *See—*
Rabindran, Karavattuveetil George; and Flint, John R., 4,093,376, Cl. 355-68.000.

Flugge, Manfred, to Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig. Radio tuning arrangement. 4,093,930, Cl. 334-86.000.

FMC Corporation: *See—*
Haley, Harold A., 4,093,146, Cl. 242-158.200.

FMN Schuster & Co.: *See—*
Hermanns, Peter, 4,093,135, Cl. 242-18.0PW.

Foord, Stanley G.; and Simpson, Walter E., to International Standard Electric Corporation. Optical fiber cable. 4,093,342, Cl. 350-96.230.

Ford, Hugh; Mraz, George J.; and Simier, Jean Noel, to National Force Company; and Societe Chimique des Charbonnages-CDF Chimie. Pressure vessel construction and method. 4,093,100, Cl. 220-3.000.

Ford Motor Company: *See—*
Currie, Robert M., 4,093,438, Cl. 65-62.000.
Hetke, Adolf; and Bonds, Kip M., 4,093,770, Cl. 428-306.000.

Ford, Thomas Edward. Artist's kit. 4,093,326, Cl. 312-231.000.

Forenade Fabriksverken: *See—*
Falk, Curt Gunnar, 4,093,052, Cl. 192-88.00B.

Formica Corporation: *See—*
DeLapp, Darwin Fiske; Goebel, James Christopher; and Bunkowski, Kenneth Dana, 4,093,579, Cl. 260-29.40R.

Formignani, Massimo: *See—*
Prodi, Vittorio; Melandri, Carlo; Tarroni, Giuseppe; Formignani, Massimo; De Zaiacomo, Tonino; and Bompane, Gianfranco, 4,092,845, Cl. 73-28.000.

Forsman, Edwin E. Teaching and display apparatus. 4,092,785, Cl. 35-1.000.

Fowler, Albert Lewis; Walker, David Martin; Stevenson, Alastair Kershaw; and Henderson, Alan Graham, to Hughes Microelectronics Limited. Multiplexed transducer. 4,092,852, Cl. 73-117.300.

Fowler, John T., to Laitram Corporation, The. Two-wire, multiple-transducer communications system. 4,093,946, Cl. 340-310.00R.

Fowles, Thomas A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Antibackoff closure. 4,093,093, Cl. 215-251.000.

Fox, Rita T.: *See—*
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,093,814, Cl. 560-139.000.

Fox Valley Marking Systems, Inc.: *See—*
Smrt, Thomas J., 4,093,068, Cl. 206-443.000.

Foxboro Company, The: *See—*
DeCarlo, Joseph P., 4,092,859, Cl. 73-194.00B.

Frank, Donald H.; Jeffries, J. Fred; Swanson, Mary C.; Erb, Thomas L.; and Hall, James D., to G. D. Searle & Co. Fibrinogen monitor. 4,092,980, Cl. 128-2.00A.

Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich. Sheet mill table roll. 4,093,023, Cl. 165-89.000.

Frauenfelder, Alfred, to American Air Filter Company, Inc. Rapping assembly and electrode supports for electrostatic precipitators. 4,093,431, Cl. 55-112.000.

Frech, Roger A., to Terminal Data Corporation. Indicia recording device. 4,093,370, Cl. 355-43.000.

Frederiksen, Jeffrey E.: *See—*
Nutting, David J.; and Frederiksen, Jeffrey E., 4,093,232, Cl. 273-121.00A.

Freed, Paul S.: *See—*
Kantrowitz, Adrian; and Freed, Paul S., 4,092,742, Cl. 3-1.700.

Freeman Chemical Corporation: *See—*
Cordts, Howard P.; Navin, Robert F.; and Ross, R. Charles, 4,093,768, Cl. 428-287.000.

Freeman, Roy H.: *See—*
Luebbert, William K.; Blankenship, Thomas O.; and Freeman, Roy H., 4,093,395, Cl. 408-224.000.

Freire Antunes, Carlos Jorge: *See—*
Kawamata, Tadahisa; Freire Antunes, Carlos Jorge; and de Brito Antunes, Carlos, 4,093,173, Cl. 249-105.000.

Frey, Rudolf: *See—*
Fischer, Rudolf; and Frey, Rudolf, 4,093,203, Cl. 270-20.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Hoffmann, Herbert; and Wachendorf, Friedrich, 4,093,133, Cl. 242-18.0PW.

Friedrich, Helmut, to Vereinigte Flugtechnische Werke-Fokker GmbH. Method of operating a turbine. 4,092,824, Cl. 60-39.020.

Fromson, Howard A. Lithographic printing plate system. 4,092,925, Cl. 101-467.000.

Fuchs, Robert: *See—*
Clemens, Richard P.; and Fuchs, Robert, 4,092,739, Cl. 3-1.000.

Fuerst, Charles O.: *See—*
Sherman, Robert M.; and Fuerst, Charles O., 4,093,547, Cl. 210-169.000.

Fuhrmann, Manfred E. Combination drill and screwdriver. 4,092,753, Cl. 7-158.000.

Fuji Photo Film Co., Ltd.: *See—*
Goto, Toshio, 4,093,956, Cl. 354-86.000.

Fujita, Masahiko; Gotoh, Toshihiko; and Nakamura, Tsutomu, to Hitachi, Ltd. Electric motor. 4,093,897, Cl. 218-138.000.

Fukumoto, Mitsunobu: *See—*
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; and Yokoyama, Shigeo, 4,093,568, Cl. 260-2.20R.

Fukuoka Paper Company, Limited: *See—*
Ogata, Mitsutoshi; and Naito, Norinao, 4,093,482, Cl. 156-210.000.

Fuller, Paul; Gillender, John Brian; Shacklady, Michael; and Basu, Samir, to Vickers Limited. Electronic franking machines. 4,093,999, Cl. 364-900.000.

Furuta, Kenji, to Olympus Optical Company Limited. Coreless motor. 4,093,882, Cl. 310-268.000.

Furutani, Yasumasa: *See—*
Tanno, Kazuo; Furutani, Yasumasa; Honda, Takashi; and Uenishi, Akira, 4,093,527, Cl. 204-129.000.

G. D. Searle & Co.: *See—*
Frank, Donald H.; Jeffries, J. Fred; Swanson, Mary C.; Erb, Thomas L.; and Hall, James D., 4,092,980, Cl. 128-2.00A.

G. D. Societa Per Azioni: *See—*
Seragnoli, Enzo, 4,092,816, Cl. 53-234.000.

GAF Corporation: *See—*
Loprest, Frank J.; and McInerney, Eugene F., 4,093,461, Cl. 96-36.000.

Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Treating molten metal with a mixture of a cryogenic fluid and solid carbon black. 4,093,553, Cl. 252-70.000.

Ganellin, Charon Robin: *See—*
Brown, Thomas Henry; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,093,621, Cl. 260-294.80H.
Durant, Graham John; Ganellin, Charon Robin; and Owen, Geoffrey Robert, 4,093,729, Cl. 424-270.000.

Gangi, Robert J., to Joan Manufacturing Corporation. Yarn guide tubes for warp knitting machines. 4,092,838, Cl. 66-214.000.

Gardner, Derek Victor, to Beecham Group Limited. 7-Aminopropoxy chromane and chromenes. 4,093,631, Cl. 260-345.200.

Garland Smith Engineering Co., Inc.: *See—*
Smith, Garland Y.; and Scott, Gerald R., 4,093,393, Cl. 408-67.000.

Garner, Geoffrey Michael: *See—*
Carter, Christopher Frederick; Blunt, Roy Trevor; Lewis, James Cyril Alexander; and Garner, Geoffrey Michael, 4,093,534, Cl. 350-355.000.

Garrett, Richard H., Sr.; and Feniger, Yale M., to Coil Tite, Inc. Recoiler spacer shooter. 4,093,141, Cl. 242-56.900.

Garten, Robert L.: *See—*
Vannice, M. Albert; and Garten, Robert L., 4,093,643, Cl. 260-449.00M.

Garza, Roberto M. Hydroelectric plant. 4,092,828, Cl. 60-506.000.

Gassner, Benno; and Gassner, Johann. Pivotal implement. 4,093,248, Cl. 280-6.100.

Gassner, Johann: *See—*
Gassner, Benno; and Gassner, Johann, 4,093,248, Cl. 280-6.100.

Gates Rubber Company, The: *See—*
Dahl, Michael M.; and Erb, Lester D., 4,093,755, Cl. 427-299.000.

Gatewood, Ralph M., to Raymond Lee Organization, Inc., The. Compressor tongs. 4,093,298, Cl. 294-118.000.

Gaudette, Charles Henry; and Williams, Raymond Charles, to International Business Machines Corporation. Hardware control storage area protection method and means. 4,093,987, Cl. 364-200.000.

Gavrikov, Viktor Vasilievich: *See—*
Matskevich, Danil Danilovich; Ivashkova, Nina Efimovna; and Gavrikov, Viktor Vasilievich, 4,092,843, Cl. 73-17.00R.

Gaworowski, Andrew J.; and Easley, Wayne W., to Dayco Corporation. Method of continuously making a printing blanket construction. 4,093,487, Cl. 156-244.160.

Gaworowski, Andrew J.: *See—*
Duckett, John C.; and Gaworowski, Andrew J., 4,093,764, Cl. 428-113.000.

Gazzani, Giovanni: *See—*
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Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, to Champion Products Inc. Method of applying flock to a substrate. 4,093,753, Cl. 427-21.000.

Gebauer, Thomas Edward; and McMullen, Larry Gene, to Deere & Company. Torsional isolator coupling. 4,092,837, Cl. 64-27.0NM.

Gebruder Buhler AG: *See—*
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Gehl Company: *See—*
Burrough, Donald E.; and Seefeld, Dean E., 4,092,914, Cl. 100-88.000.

Geierhaas, Herbert: *See—*
Buechner, Oskar; Geierhaas, Herbert; Gierth, Volker; Mueller, Siegfried; and Zacher, Wieland, 4,093,703, Cl. 423-245.000.

Genchev, Lyubomir Nikolov; Kafedjiev, Iliya Chudomirov; and Klyamov, Kostadin Spirov, to DSO "Bulgarplod". Machine for vacuum peeling fruits and vegetables. 4,092,910, Cl. 99-472.000.

General Atomic Company: *See—*
Slivenko, Victor, 4,092,983, Cl. 128-214.00R.

General Cable Corporation: *See—*
Swiatovy, Edward Stanley, Jr., 4,093,414, Cl. 425-113.000.
General Electric Company: *See—*
Anderson, John M., 4,093,893, Cl. 315-48.000.
Banucci, Eugene George; and Olander, Walter Karl, 4,093,598, Cl. 260-47.0ET.
Bigelow, John E., 4,093,356, Cl. 350-338.000.
Brandt, Richard Thornton; and Hein, Paul William, 4,093,862, Cl. 250-445.00T.
Dashner, Richard F.; and Bouchey, George J., 4,092,812, Cl. 52-309.300.
Denny, Dann W., 4,093,899, Cl. 318-227.000.
Dills, Raymond L., 4,093,841, Cl. 219-10.55E.
Donaghy, Robert E., 4,093,756, Cl. 427-304.000.
Eaton, Milton, 4,093,846, Cl. 219-286.000.
Factor, Arnold; Jaquiss, Donald Benjamin George; and Mark, Victor, 4,093,589, Cl. 260-45.75B.
Germer, Warren R., 4,093,997, Cl. 364-900.000.
Greskovich, Charles D.; and O'Clair, Chester R., 4,093,687, Cl. 264-65.000.
Kelman, Arnold Lloyd; and O'Dell, William Raymond, 4,093,860, Cl. 250-445.00T.
Kelman, Arnold Lloyd; and Peterson, Thomas Eben, 4,093,861, Cl. 250-445.00T.
Kewley, Norman E.; and Smetana, Andrew, 4,093,979, Cl. 362-5.000.
Leighton, Leroy G., 4,093,894, Cl. 315-64.000.
Linger, Harrison K., 4,093,327, Cl. 312-244.000.
Mark, Victor; and Wilson, Phillip Steven, 4,093,582, Cl. 260-30.60R.
Mark, Victor, 4,093,590, Cl. 260-45.85S.
Miller, Donald E., 4,094,001, Cl. 364-900.000.
M'Sadoques, Andre J.; and Sabatella, Robert J., 4,093,970, Cl. 361-361.000.
Olander, Walter Karl, 4,093,596, Cl. 260-47.0ET.
Olander, Walter Karl, 4,093,597, Cl. 260-47.0ET.
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Plunkett, Allan Barr, 4,093,900, Cl. 318-370.000.
Scott, Paul F., 4,093,988, Cl. 364-484.000.
Siegler, Manfred; and Wong, Ted Lee, 4,093,429, Cl. 55-58.000.
Watrous, Donald L.; and Dobberphul, Daniel W., 4,093,909, Cl. 323-22.00R.
General Motors Corporation: *See—*
Fitzpatrick, John D.; and Smith, Gary L., 4,093,273, Cl. 280-696.000.
Hildebrandt, William V.; and Miller, Allan G., 4,093,088, Cl. 214-451.000.
Kaplit, Michael; Hayden, Daniel B.; and Smith, George W., 4,093,355, Cl. 350-334.000.
MacArthur, Robert I., 4,093,388, Cl. 403-46.000.
Scott, David I., 4,093,842, Cl. 219-121.0LM.
Wize, Gary A., 4,093,275, Cl. 280-747.000.
General Signal Corporation: *See—*
Auer, John H., Jr., 4,093,161, Cl. 246-5.000.
Shah, Mahesh J.; and Mallozzi, Joseph P., 4,093,867, Cl. 250-576.000.
George, Henry H., Jr.: *See—*
Gordon, Marvin; Hannon, Martin J.; and George, Henry H., Jr., 4,093,571, Cl. 260-2.50B.
Gerken, Albert: *See—*
Soehngen, John W.; and Gerken, Albert, 4,093,404, Cl. 417-317.000.
Gerking, Luder: *See—*
Hartmann, Ludwig; Maahs, Paul F.; Gerking, Luder; Ruzek, Ivo; and Schafer, Eberhard, 4,093,763, Cl. 428-95.000.
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Germer, Warren R., to General Electric Company. Portable programmer for time-of-day metering register system and method of using same. 4,093,997, Cl. 364-900.000.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Hadi, Ali Sameh Abdel; Menzler, Peter-Michael; and Reinhardt, Johann, 4,093,697, Cl. 423-2.000.
Jungst, Klaus-Peter; and Ries, Gunter, 4,093,817, Cl. 174-32.000.
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Gillberg, Torsten. Method of liquid treating cellulose fibres with elastic pressure shocks. 4,093,507, Cl. 162-18.000.
Gillender, John Brian: *See—*
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Gilligan, William H.; and Kamlet, Mortimer J., to United States of America, Navy. Method of preparing the acid copper salt of 5-nitrotetrazole. 4,093,623, Cl. 260-299.000.
Gilson, Richard D., to Ohio State University Research Foundation, The. Semi-automatic aircraft control system. 4,093,159, Cl. 244-187.000.
Gimbel, Jurgen: *See—*
Scholz, Hansjurgen; Gimbel, Jurgen; and Jahn, Walter, 4,093,274, Cl. 280-747.000.
Giometti, Paul Francis, to Facet Enterprises, Inc. Engine starting mechanism. 4,092,870, Cl. 74-7.00R.
Girling Limited: *See—*
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Gish, David B., to Bell & Howell Company. Speed-switchable readback signal equalization and direct-current restoration. 4,093,965, Cl. 360-65.000.
Gladstone, David John; and Moldram, Peter Andrew, to Post Office. Data transmission system. 4,093,825, Cl. 179-15.0BS.
Glasrock Products, Inc.: *See—*
Midorikawa, Yoshio, 4,093,769, Cl. 428-295.000.
Glass, John P.: *See—*
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Glaxo Laboratories Limited: *See—*
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Phillipps, Gordon H.; and Bain, Brian M., 4,093,721, Cl. 424-243.000.
Gleason, John. Superfly game apparatus. 4,093,231, Cl. 273-108.000.
Glenn, Robert G., to Electric Power Research Institute, Inc. Turbine rotor with ceramic blades. 4,093,399, Cl. 416-95.000.
Go, Santos W., to Owens-Illinois, Inc. Polyester stabilization, and composition. 4,093,593, Cl. 260-45.85P.
Goebel, James Christopher: *See—*
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Goettler, Ernst: *See—*
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Goff, Frederick. Universal feed finger device. 4,093,246, Cl. 279-41.00A.
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Goldfain, Vitaly Naumovich: *See—*
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United States of America, National Aeronautics and Space Administration; Goldstein, Howard E.; Leiser, Daniel B.; and Katvala, Victor W., 4,093,771, Cl. 428-312.000.
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Goodale, Richard J. Blanching apparatus. 4,092,911, Cl. 99-483.000.
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Goodsell, Melton Archie. Irrigation pipe laying and pick up vehicle. 4,093,082, Cl. 214-1.0PA.
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Goodyear Tire & Rubber Company, The: *See—*
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Gordon, David A.: *See—*
Hall, Luther A. R.; and Gordon, David A., 4,093,809, Cl. 548-308.000.
Gordon, Marvin; Hannon, Martin J.; and George, Henry H., Jr., to

Celanese Corporation. Process for making porous metal containing powder coating compositions. 4,093,571, Cl. 260-2.50B.

Gornik, Erich: *See—*
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Gotoh, Toshihiko: *See—*
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Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs-u. Verwertungs Gesellschaft mbH. Apparatus for detaching wires cut to length from a disordered bundle of wire. 4,093,106, Cl. 221-224.000.

Gottfried Bischoff Bau Kompl. Gasreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft: *See—*
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Gotz, Manfred Karl: *See—*
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Gould Inc.: *See—*
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Strybel, Richard V., 4,092,865, Cl. 73-756.000.

Goursky, Vsevolod: *See—*
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Gowing, Ellis, to St. Francis Hospital, Inc. Cardiopulmonary resuscitation teaching aid. 4,092,788, Cl. 35-17.000.

Gozzo, Franco: *See—*
Abbruzzese, Luigi; Gozzo, Franco; Rossi, Giorgio; Masoero, Marcella; Lorusso, Simone; Bonola, Paola; and Tamburin, Gino, 4,093,727, Cl. 424-258.000.

Grammatopoulos, Nick G., to Groman Corporation. Plural chamber sheet metal gas burner and method of manufacture. 4,092,975, Cl. 126-41.00R.

Gras, Roger: *See—*
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Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., to Standard Oil Company, The. Molybdate catalysts. 4,093,558, Cl. 252-432.000.

Gravelle, Homer E., to Sundstrand Corporation. Compressor impeller and method of manufacture. 4,093,401, Cl. 416-185.000.

Graybill, Wilmer B.: *See—*
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Grayson, John F.; and Groth, Peter K. H., to Standard Oil Company (Indiana). Mineral prospecting by organic diagenesis. 4,093,420, Cl. 23-230.0EP.

Graystone Corporation: *See—*
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Greaves, Jeffrey Chester: *See—*
Burgess, Robin Henry; and Greaves, Jeffrey Chester, 4,093,787, Cl. 526-62.000.

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Green Cross Corporation, The: *See—*
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Greenwell, Joseph Daniel; Hughes, Charles C.; and Kinney, Robert W., to R. A. Jones & Co. Inc. Magazine and feeder for carton blanks. 4,093,207, Cl. 271-3.100.

Greenwood Mills, Inc.: *See—*
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Gregg, Edmund; and Melocik, Grant C., to Towmotor Corporation. Load moment sensing system for lift trucks. 4,093,091, Cl. 214-673.000.

Gregory, Gordon Ian: *See—*
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Greig, Ian Robert Kennedy, to Pilkington Brothers Limited. Glass fiber reinforced cement composite materials. 4,093,471, Cl. 106-99.000.

Greskovich, Charles D.; and O'Clair, Chester R., to General Electric Company. Hot pressing of silicon nitride using magnesium silicide. 4,093,687, Cl. 264-65.000.

Griesch, Dorothee; Schroter, Herbert; Schwagler, Peter; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Methods and apparatus for automatic exposure control. 4,093,375, Cl. 355-68.000.

Griffin, Clyde C.: *See—*
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Griffin, J. Curtis; and Griffin, Clyde C., to Harrington Manufacturing Co. Method and apparatus for seed tape planting. 4,092,936, Cl. 111-1.000.

Grimm, Hermann: *See—*
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Grinberg, Jan: *See—*
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Groman Corporation: *See—*
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Groom, Kenneth Dale, to Boeing Company, The. Instrument and panel cooling apparatus. 4,093,021, Cl. 165-1.000.

Groome, Ernest J., to Clupak, Inc. Nip roll for treating web materials. 4,092,917, Cl. 100-176.000.

Grosjean, Jon Paul, to GTE Sylvania Incorporated. Receiver having a phase-locked loop. 4,093,824, Cl. 179-15.0BT.

Gross, Benjamin; and Lee, Wooyoung, to Mobil Oil Corporation. FCC Catalyst section control. 4,093,537, Cl. 208-164.000.

Gross, Gerd: *See—*
Seybold, Rolf; and Gross, Gerd, 4,093,019, Cl. 164-52.000.

Groth, Peter K. H.: *See—*
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Grove, George Luther, to Cincinnati Milacron Inc. Wheel clamping device. 4,092,807, Cl. 51-168.000.

Grubbs, Harvey J.: *See—*
Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., 4,092,988, Cl. 131-17.00R.

Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
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Grundmann, Peter: *See—*
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Grunwald, Frederick A., to Mead Johnson & Company. Process for reducing blood sugar concentration in a mammal. 4,093,741, Cl. 424-321.000.

Gryglas, Stephen. Adjustable two-way cam cleat. 4,092,941, Cl. 114-218.000.

GTE Lenkurt Electric (Canada) Ltd.: *See—*
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GTE Sylvania Incorporated: *See—*
Collette, Robert P., 4,093,895, Cl. 315-371.000.
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Guarino, Carmen F., to Autotrol Corporation. Activated sludge treatment of wastewater. 4,093,539, Cl. 210-17.000.

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Guenther, Joachim, to Xerox Corporation. Pre-separated recirculating document copying system. 4,093,372, Cl. 355-50.000.

Gueret, Jean-Louis: *See—*
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Gulf Oil Corporation: *See—*
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Gulf Research & Development Company: *See—*
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Gulf & Western Industries, Inc.: *See—*
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Gurtler, Richard Warren; Handy, Robert Maxwell; Keeling, Michael Chancey; and Lesk, Israel Arnold, to Motorola, Inc. Flat plate solar collector. 4,092,977, Cl. 126-270.000.

Gurwicz, David, to Sevcon Limited. D.C. Electrical circuit means. 4,093,980, Cl. 363-57.000.

Gustavsson, Lars G. T.; and Svensson, Sven-Hakan, to AB Bofors. Device for firearm intended for tank which has a barrel supported in a recoil jacket. 4,092,901, Cl. 89-46.000.

Gutierrez, Eddie Nelson: *See—*
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Guyer, August, to Escher Wyss Limited. Filtration apparatus. 4,093,552, Cl. 210-297.000.

Gyori, Janos: *See—*
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Haag, Werner O.: *See—*
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Habeger, Charles C., Jr.; and Quy, Dennis A., to Phillips Petroleum Company. Raster display position detection. 4,093,947, Cl. 340-324.0AD.

Habermeier, Jurgen; and Berner, Godwin, to Ciba-Geigy Corporation. Metal salts of N-hydroxyalkylated or N-aminoalkylated branched α-aminoacids. 4,093,639, Cl. 260-429.900.

Habiger, Cyril W.; and Robinson, Tom E., to Caterpillar Tractor Co. Load limiting device. 4,093,092, Cl. 214-674.000.

Habinger, Max. Automatic runway traffic direction control. 4,093,937, Cl. 340-26.000.

Hadi, Ali Sameh Abdel; Menzler, Peter-Michael; and Reinhardt, Johann, to Gesellschaft fur Kernforschung m.b.H. Process for recovering molybdenum-99 from a matrix containing neutron irradiated fissionable materials and fission products. 4,093,697, Cl. 423-2.000.

Haeussermann, Walter, to United States of America, Administrator, National Aeronautics and Space Administration. Velocity measurement system. 4,093,917, Cl. 324-173.000.

Hagan, Joseph Weldon, to Union Carbide Corporation. Thermosetting vinyl chloride polymer powder coatings. 4,093,575, Cl. 260-15.000.
Hahn, Alfred; Steiner, Ernst; and Pospischil, Rudolf, to Siemens Aktiengesellschaft. Primary X-ray diaphragm assembly. 4,093,864, Cl. 250-505.000.
Hain, Paul O., to Champion International Corporation. Automotive exhaust system using filter containing calcium carbonate coating. 4,093,422, Cl. 23-284.000.
Hairgrove, Nelson, Sr. Controller for DC arc welding generators. 4,093,845, Cl. 219-132.000.
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., to Caterpillar Tractor Co. Vehicle steering brake and clutch control. 4,093,048, Cl. 192-13.00R.
Hale, C. Marion. Net holding stanchion assembly. 4,093,224, Cl. 273-95.00H.
Hale, David Jerry, to Brunswick Corporation. Internal combustion engine. 4,092,958, Cl. 123-73.0PP.
Haley, Harold A., to FMC Corporation. Winding method and apparatus for strapping and strapping package. 4,093,146, Cl. 242-158.200.
Hall, Dennis G., to Burroughs Corporation. Adjustable holder particularly useful for mounting magnetic heads. 4,093,966, Cl. 360-109.000.
Hall, James D.: *See*—
Frank, Donald H.; Jeffries, J. Fred; Swanson, Mary C.; Erb, Thomas L.; and Hall, James D., 4,092,980, Cl. 128-2.00A.
Hall, Kenneth: *See*—
Edwards, Robert Harry; Williams, Thomas Alan; and Hall, Kenneth, 4,093,662, Cl. 260-606.50P.
Hall, Luther A. R.; and Gordon, David A., to Ciba-Geigy Corporation. 5-Substituted phosphonate hydantoins and derivatives thereof. 4,093,809, Cl. 548-308.000.
Ham, George E.; and Krause, Ruben L., to Dow Chemical Company, The. Cyclic oligomers of N-substituted aziridines. 4,093,615, Cl. 260-239.0BC.
Hamada, Mitsuharu: *See*—
Takemura, Tooji; Saitoh, Shigeru; and Hamada, Mitsuharu, 4,092,930, Cl. 104-247.000.
Hamanaka, Michito; Sano, Toshio; and Kumura, Noriharu, to Idemitsu Kosan Company Limited. Stirred gas bubble fermenter. 4,093,518, Cl. 195-142.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,092,918, Cl. 101-288.000.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,093,718, Cl. 424-200.000.
Hammons, Carl A.; and Kraft, Philip O., to Kraft Systems, Inc. Control stick assembly for radio control equipment. 4,093,953, Cl. 343-225.000.
Handy, Robert Maxwell: *See*—
Gurtler, Richard Warren; Handy, Robert Maxwell; Keeling, Michael Chancey; and Lesk, Israel Arnold, 4,092,977, Cl. 126-270.000.
Hannon, Martin J.: *See*—
Gordon, Marvin; Hannon, Martin J.; and George, Henry H., Jr., 4,093,571, Cl. 260-2.50B.
Hansen, Howard C., to Clark Equipment Company. Constraint means for flexible elements. 4,092,997, Cl. 137-351.000.
Hansen, Manfred W.; and Kersting, Emil F., to Sack GmbH. Apparatus for cutting steel sections. 4,092,891, Cl. 83-341.000.
Hapke, Kenyon A., to Bell & Howell Company. Motion picture projector apparatus and high intensity projection arrangement. 4,093,366, Cl. 352-198.000.
Hara, Katsuaki: *See*—
Uyama, Noboru; and Hara, Katsuaki, 4,093,032, Cl. 177-165.000.
Harada, Tatsuo: *See*—
Yabutani, Kunihiro; Ikeda, Kenichi; Hatta, Shigenori; and Harada, Tatsuo, 4,093,743, Cl. 424-324.000.
Hardouin, Yves: *See*—
Morane, Bruno; Hardouin, Yves; and Gueret, Jean-Louis, 4,093,124, Cl. 239-327.000.
Hardy, Edgar E.: *See*—
Parts, Leo P.; and Hardy, Edgar E., 4,093,684, Cl. 264-25.000.
Hargrove, Logan Ezral, to Bell Telephone Laboratories, Incorporated. Optical waveguide having periodic spatial perturbations. 4,093,343, Cl. 350-96.300.
Hari, Stefan; and Roueche, Armand, to Ciba-Geigy Corporation. Trisazo pigments containing two barbituric acid coupling components. 4,093,613, Cl. 260-154.000.
Harley, Alfred H., to Speed-Line Manufacturing Company, Inc. Method for making pipe fitting coverings. 4,093,683, Cl. 264-25.000.
Harnischfeger Corporation: *See*—
Morters, Ronald W.; and Millonzi, Lawrence A., 4,093,898, Cl. 318-227.000.
Wieschel, John E., 4,093,184, Cl. 254-139.100.
Harrington, Colin John: *See*—
Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,093,554, Cl. 252-78.300.
Harrington Manufacturing Co.: *See*—
Griffin, J. Curtis; and Griffin, Clyde C., 4,092,936, Cl. 111-1.000.
Harris, Erik Preston; and Keyes, Robert William, to International Business Machines Corporation. Method for fabricating ultra-narrow metallic lines. 4,093,503, Cl. 156-628.000.
Harris, Richard, to Mack and Gooding, a part interest. Swimming pool apparatus. 4,092,746, Cl. 4-172.170.
Harris, Robert F.; and Wagener, Earl H., to Dow Chemical Company, The. Novel onium surfactants. 4,093,663, Cl. 260-607.00B.
Harrison, Reginald William; and Peach, George Albert, to Warne Surgical Products Limited. Method of making surgical catheters and tubes. 4,093,484, Cl. 156-244.130.
Hart, John Peter: *See*—
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,093,753, Cl. 427-21.000.
Hart, Robert J., to Commercial Resins Company. Internal pipe coating apparatus. 4,092,950, Cl. 118-8.000.
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Stabilized polymeric composition in contact with metals. 4,093,774, Cl. 428-379.000.
Hartman, John M.; and Erb, Darrell M., to Hughes Aircraft Company. Charge coupled device with input for direct injection of signal. 4,093,872, Cl. 307-221.00D.
Hartman, Marvis E.: *See*—
Chang, Wen-Hsuan; Dowbenko, Rostyslaw; Hartman, Marvis E.; and Porter, Samuel, Jr., 4,093,673, Cl. 260-824.0EP.
Hartmann, Karl-Heinz; and Mayer, Hans-Gunther, to Albert-Frankenthal AG. Folding device for roller rotating printing presses. 4,093,206, Cl. 270-67.000.
Hartmann, Ludwig; Maahs, Paul F.; Gerking, Luder; Ruzek, Ivo; and Schafer, Eberhard, to Lutravil Spinnvlies GmbH & Co. Multiple-layered non-woven fabric. 4,093,763, Cl. 428-95.000.
Hasenauer, Dieter: *See*—
Sassmannshausen, Gunter; and Hasenauer, Dieter, 4,093,785, Cl. 429-149.000.
Hashimoto, Takashi: *See*—
Araya, Kenzo; and Hashimoto, Takashi, 4,092,919, Cl. 101-53.000.
Haslett, Robert Alan, to Ricardo & Co., Engineers (1927) Limited. I.C. Engines. 4,092,967, Cl. 123-143.00B.
Hatayama, Yoshio: *See*—
Nishikawa, Yasuo; Watanabe, Akira; Sugimoto, Tetsuya; Yabuki, Kazuyasu; and Hatayama, Yoshio, 4,093,561, Cl. 252-466.00J.
Hatta, Shigenori: *See*—
Yabutani, Kunihiro; Ikeda, Kenichi; Hatta, Shigenori; and Harada, Tatsuo, 4,093,743, Cl. 424-324.000.
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., to E. R. Squibb & Sons, Inc. Esters of 4-[3-(substituted amino)-2-hydroxypropoxy]-5,6,7,8-tetrahydro-1,6,7-naphthalenetriols. 4,093,814, Cl. 560-139.000.
Haugwitz, Rudiger D.; and Cruthers, Larry R., to E. R. Squibb & Sons, Inc. Sulfoxide derivatives of benzimidazoles. 4,093,732, Cl. 424-273.00R.
Hauri, Jacques: *See*—
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,093,827, Cl. 179-15.0AT.
Hausberg, Gerhard; Hegemann, Karl-Rudolf; Finger, Gunther; Schafer, Hans; and Weissert, Helmut, to Gottfried Bischoff Bau Kompl. Gasreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft. Gas-scrubber apparatus for blast furnace. 4,093,434, Cl. 55-226.000.
Hauser, Oscar G.; Mannik, Kallis H.; and Whited, Charles A., to Xerox Corporation. Method of transfer. 4,093,457, Cl. 96-1.200.
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, to Yeda Research and Development Co., Ltd. Thiocarbamatemethyl-substituted cephalosporin derivatives. 4,093,802, Cl. 544-27.000.
Haviv, Fortuna; and Patchornik, Abraham, to Yeda Research and Development Co., Ltd. Pyridiniummethylaryl-substituted cephalosporin derivatives. 4,093,804, Cl. 544-27.000.
Hayden, Daniel B.: *See*—
Kaplit, Michael; Hayden, Daniel B.; and Smith, George W., 4,093,355, Cl. 350-334.000.
Heckelsberg, Louis F., to Phillips Petroleum Company. Catalytic cracking and dehydrocyclizing of alkanes using alkaline earth oxides promoted with manganese oxide and/or rhenium oxide. 4,093,536, Cl. 208-121.000.
Heckmaier, Joseph: *See*—
Bauer, Johann; and Heckmaier, Joseph, 4,093,791, Cl. 526-200.000.
Hedlund, Lee Vern, to RCA Corporation. Chrominance signal transcoding apparatus. 4,093,959, Cl. 358-4.000.
Heese, Joachim: *See*—
Fahnenstich, Rudolf; Heese, Joachim; and Lewis, Dyfed, 4,093,740, Cl. 424-319.000.
Hefner, Paul, to Stewart, Ralph, a part interest. Rotatable engine supporting apparatus. 4,093,199, Cl. 269-61.000.
Hegemann, Karl-Rudolf: *See*—
Hausberg, Gerhard; Hegemann, Karl-Rudolf; Finger, Gunther; Schafer, Hans; and Weissert, Helmut, 4,093,434, Cl. 55-226.000.
Hein, Paul William: *See*—
Brandt, Richard Thornton; and Hein, Paul William, 4,093,862, Cl. 250-445.00T.
Hein, Wolfgang; and Grundmann, Peter, to Carl Schleicher & Schull. Syringe adapted to overcome a pressure resistance. 4,093,108, Cl. 222-401.000.
Heine, Heinrich; Woditsch, Peter; Bohmann, Theodor; and Rade, Dieter, to Bayer Aktiengesellschaft. Coated stabilized cadmium chalcogenide pigments. 4,093,777, Cl. 428-403.000.
Heinemann Electric Company: *See*—
Nicol, Ronald, 4,093,838, Cl. 200-303.000.
Heinlein, Karl Hans; and Busch, Joachim. Method for processing textile material. 4,093,417, Cl. 8-137.000.
Heinz, David M.; and Whitcomb, Eugene C., to Rockwell International Corporation. Epitaxial, sodium-substituted lithium ferrite films. 4,093,781, Cl. 428-539.000.
Heirbaut, Wilfried Andre, to AGFA-GEVAERT N.V. Process for making polymeric film. 4,093,695, Cl. 264-289.000.
Heller, Jorge: *See*—
Choi, Nam Sok; and Heller, Jorge, 4,093,709, Cl. 424-19.000.

Hellstrom, Nils Erik, to AB Hammars Mekaniska Verkstad. Method for root end cutting of lumber and a device for performing said method. 4,093,007, Cl. 144-326.00R.

Henderson, Alan Graham: *See—*
Fowler, Albert Lewis; Walker, David Martin; Stevenson, Alastair Kershaw; and Henderson, Alan Graham, 4,092,852, Cl. 73-117.300.

Henein, Kamal Labib; and Goursky, Vsevolod, to Commissariat a l'Energie Atomique. Baseline restorer circuit. 4,093,876, Cl. 307-264.000.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Pyridine esters of cyclopropane-carboxylic acid. 4,093,622, Cl. 260-295.00R.

Henricks, John A.; and Wild, Robert E., to Wild, Edward B. Bright acid zinc electroplating baths. 4,093,523, Cl. 204-55.00R.

Henricson, Kaj Olof, to Osakeyhtio, A. Ahlstrom. Process for recovering chemicals from the waste liquors of sulfate cellulose digestion and the waste waters of bleaching. 4,093,508, Cl. 162-30.00K.

Henry, James L.; and Ruoff, Carl F., Jr., to Bendix Corporation, The. Multi-axis load cell. 4,092,854, Cl. 73-133.00R.

Heraeus Christ GmbH: *See—*
Sinn, Hartmut; Schroder, Dieter; and Stallmann, Hans, 4,093,118, Cl. 233-26.000.

Hercules Incorporated: *See—*
Zecher, David C., 4,093,557, Cl. 252-389.00R.

Hermann, Hansjurg, to Konishiroku Photo Ind., Ltd. Process and device for electrophotographic image generation and application of the process. 4,093,456, Cl. 96-1.0PE.

Hermanns, Peter, to FMN Schuster & Co. Device for controlling a reserve winding when winding thread on a spool or core. 4,093,135, Cl. 242-18.0PW.

Hernandez, Gilbert Villanueva, to National Semiconductor Corporation. Screw back removal tool. 4,092,879, Cl. 81-6.000.

Herr, John Addison: *See—*
Coughenour, Donald Jay; and Herr, John Addison, 4,092,938, Cl. 112-158.00E.

Hessels, Eleutheer A. Devices for gripping wheels. 4,093,006, Cl. 144-288.00A.

Hetke, Adolf; and Bonds, Kip M., to Ford Motor Company. Coating for gasifiable foam patterns. 4,093,770, Cl. 428-306.000.

Heuer, Dale Arthur; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, to International Business Machines Corporation. Microprocessor system. 4,093,982, Cl. 364-200.000.

Heuer, Dennis M.: *See—*
Eberhardt, Robert M.; McNana, James Arthur; and Heuer, Dennis M., 4,093,005, Cl. 140-123.600.

Heuer, Dieter: *See—*
Tauber, Manfred; and Heuer, Dieter, 4,093,419, Cl. 21-102.00R.

Heuer, Peter: *See—*
Staroste, Joachim; and Heuer, Peter, 4,093,305, Cl. 297-184.000.

Hevesi, Joseph F.: *See—*
Christiana, William R.; and Hevesi, Joseph F., 4,093,132, Cl. 242-7.030.

Hewitt, Robert E., to Xerox Corporation. Cleaning system. 4,093,369, Cl. 355-15.000.

Hickson & Welch Limited: *See—*
Davidson, Hugh; Johnson, Keith Trevor; Leggeter, Brian Ernest; and Moore, Anthony John, 4,093,645, Cl. 260-505.00C.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.

Hildebrandt, William V.; and Miller, Allan G., to General Motors Corporation. Underfloor tire storage. 4,093,088, Cl. 214-451.000.

Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, to U.S. Philips Corporation. Optical storage disk system with disk track guide sectors. 4,094,013, Cl. 365-234.000.

Hill, Bernhard: *See—*
Pepperl, Rudiger; Kruger, Johann; and Hill, Bernhard, 4,094,010, Cl. 365-215.000.

Hill, David Taylor, to SmithKline Corporation. Antiarthritic compositions comprising bis[(trialkyl-phosphine)gold(I)]sulfides and methods of producing antiarthritic activity. 4,093,719, Cl. 424-215.000.

Hill, Donald R. J., to Gulf Oil Corporation. Melt extrusion process. 4,093,692, Cl. 264-95.000.

Hill, Howard D. W., to Varian Associates, Inc. Nuclear magnetic resonance pick-up circuit for control of resonance conditions. 4,093,910, Cl. 324-0.5AH.

Hill, Howard D. W.; and Laudermilch, John R., to Varian Associates, Inc. Nuclear magnetic resonance spectrometer employing an improved resonance signal gating circuit. 4,093,911, Cl. 324-.5AH.

Hilzensauer, Volkmar: *See—*
Kirsch, Kurt; Hilzensauer, Volkmar; Pflug, Gunther; Wehrmann, Felix; and Maresch, Gerald, 4,093,488, Cl. 156-245.000.

Himmel, David Paul: *See—*
Bryan, Larry Wayne; Himmel, David Paul; and Woster, George William, Jr., 4,093,941, Cl. 340-146.3AE.

Hioki, Ikuo: *See—*
Nishino, Hisashi; Hosokawa, Teruo; and Hioki, Ikuo, 4,093,346, Cl. 350-162.0SF.

Hirabayashi, Masaya; Omi, Naoki; Nakano, Yuji; and Oshiba, Tetsuro, to Kyoto Ceramic Co., Ltd. Process for synthesizing and growing single crystalline beryl. 4,093,502, Cl. 156-624.000.

Hirdes, Rudiger. Dental appliance for introducing a filler material into a tooth cavity. 4,092,778, Cl. 32-60.000.

Hirose, Akio: *See—*
Konno, Ryozo; Ikeda, Akira; Ugai, Toshimitsu; and Hirose, Akio, 4,093,577, Cl. 260-22.0CB.

Hirose, Takeshi: *See—*
Yoshida, Risaburo; Kaiho, Keisuke; Ide, Yusaku; and Hirose, Takeshi, 4,093,424, Cl. 44-3.00C.

Hiroyama, Hiroo: *See—*
Kaneko, Ryoichi; Nii, Katutosi; Hiroyama, Hiroo; and Okano, Kinpei, 4,093,320, Cl. 308-9.000.

Hitachi, Ltd.: *See—*
Fujita, Masahiko; Gotoh, Toshihiko; and Nakamura, Tsutomu, 4,093,897, Cl. 218-138.000.
Kaneko, Ryoichi; Nii, Katutosi; Hiroyama, Hiroo; and Okano, Kinpei, 4,093,320, Cl. 308-9.000.
Takaoka, Tadashi; and Toyota, Eiichi, 4,093,162, Cl. 246-182.00B.
Tanno, Kazuo; Furutani, Yasumasa; Honda, Takashi; and Uenishi, Akira, 4,093,527, Cl. 204-129.000.

Hitachi Metals, Ltd.: *See—*
Iwata, Masao; and Yoshizawa, Hisao, 4,093,477, Cl. 148-108.000.

Hitney, Herbert V., to United States of America, Navy. Means for determining the refractive index profile of the atmosphere. 4,093,918, Cl. 325-67.000.

Hobeg Hochtemperaturreaktor - Brennelement GmbH: *See—*
Hrovat, Milan; and Rachor, Lothar, 4,093,682, Cl. 264-0.500.

Hodge, John E. Fifth-wheel braking control. 4,093,265, Cl. 280-438.00R.

Hodges, James J. Flat plane holding fixture. 4,092,783, Cl. 33-180.00R.

Hoechst Aktiengesellschaft: *See—*
Arpe, Hans-Jurgen, 4,093,666, Cl. 260-615.00A.
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, 4,093,735, Cl. 424-274.000.
Fernholz, Hans; Roscher, Gunter; Schmidt, Hans-Joachim; Schmitz, Heinz; and Wunder, Friedrich, 4,093,559, Cl. 252-443.000.
Griesch, Dorothee; Schroter, Herbert; Schwagler, Peter; and Stein, Eckehard, 4,093,375, Cl. 355-68.000.
Kandler, Joachim; Komorniczyk, Klaus; and Reitz, Mathias, 4,093,538, Cl. 209-172.500.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,093,592, Cl. 260-45.85B.
Ruckert, Hans; and Wildenhain, Barbara, 4,093,464, Cl. 96-91.00D.
Teige, Wolfgang; and Schickfluss, Rudolf, 4,093,585, Cl. 260-40.00P.

Hoerauf, Werner: *See—*
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.

Hofer, Gerald; Eheim, Franz; and Kopse, Odon, to Robert Bosch GmbH. Pump nozzle for fuel injection in internal combustion engines. 4,092,964, Cl. 123-139.0AT.

Hoffa, Randy Lee. War game apparatus. 4,093,236, Cl. 273-255.000.

Hoffman, Borje, to Hoffmans Verkstads AB. Ski binding. 4,093,269, Cl. 280-615.000.

Hoffmann, Arthur H.; Gorden, Dale I.; and Kilgore, Lee A., to Westinghouse Electric Corp. Quadrature axis field brushless exciter. 4,093,869, Cl. 290-31.000.

Hoffmann, Herbert; and Wachendorf, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Formation of a reserve winding thread of defined length on bobbins of a textile machine. 4,093,133, Cl. 242-18.0PW.

Hoffmann, Herwig: *See—*
Reiss, Wolfgang; Joschek, Hans-Ingo; Schnur, Rudolf; Winderl, Siegfried; Dehler, Juergen; and Hoffmann, Herwig, 4,093,668, Cl. 568-855.000.

Hoffmann-La Roche Inc.: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,093,632, Cl. 260-345.500.
Coffen, David Llewellyn, 4,093,654, Cl. 260-561.00A.

Hoffmans Verkstads AB: *See—*
Hoffman, Borje, 4,093,269, Cl. 280-615.000.

Hogan, Walter John; Schwartz, Alfred Alexander; and Stewart, Joseph Robert, to International Business Machines Corporation. Cursor for an on-the-fly digital television display having an intermediate buffer and a refresh buffer. 4,093,996, Cl. 364-900.000.

Hoganas AB, Fack: *See—*
Svensson, Lars-Erik; Tengzelius, Jan Robert; and Lindskog, Per Folke, 4,093,449, Cl. 75-0.50R.

Hokuriku Pharmaceutical Co., Ltd.: *See—*
Kato, Hideo; Nishikawa, Tomoyasu; and Koshinaka, Eiichi, 4,093,630, Cl. 260-326.850.

Holcroft & Company: *See—*
Schwalm, Donald J., 4,093,195, Cl. 266-251.000.

Holick, Stephen Alan: *See—*
Wu, Samuel Chinlun; and Holick, Stephen Alan, 4,092,940, Cl. 113-29.000.

Holland, Robert Charles: *See—*
Lindstrom, George Adam; and Holland, Robert Charles, 4,093,843, Cl. 219-121.0EB.

Hollander, Edward F., Jr., to Glass, John P. Mixing package. 4,093,067, Cl. 206-219.000.

Hollister Incorporated: *See—*
Nolan, John L.; Nordby, Harvey M.; and Jensen, Marvin E., 4,093,277, Cl. 282-24.00R.

Hom, Felix: *See—*
Linderman, Duane L.; and Hom, Felix, 4,093,122, Cl. 239-127.300.

Homeyer, Bernhard: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,093,718, Cl. 424-200.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ishihara, Takeo; Yamamoto, Hitoshi; and Iiga, Tsuyoshi, 4,093,264, Cl. 280-296.000.
Koyama, Mikihiro; and Watanabe, Kazuo, 4,093,262, Cl. 280-279.000.
Honda, Takashi: *See*—
Tanno, Kazuo; Furutani, Yasumasa; Honda, Takashi; and Uenishi, Akira, 4,093,527, Cl. 204-129.000.
Honeywell Inc.: *See*—
Lang, Kenneth T., 4,093,353, Cl. 350-313.000.
Shroff, Bansi K.; Dekker, Frank; and Nordrehaug, John, 4,093,149, Cl. 242-198.000.
Hong, Kwang Kil. Process for laminating photographs and the like into molded articles of melamine-formaldehyde resin. 4,093,489, Cl. 156-245.000.
Honig, Milton L.; Greco, Carl C.; and Walsh, Edward N., to Stauffer Chemical Company. Production of perchloromethyl mercaptan. 4,093,651, Cl. 260-543.00H.
Honkanen, Arto; and Laiho, Erkki, to Pekema OY. Method and apparatus for manufacturing an even laminated product by extrusion. 4,093,486, Cl. 156-244.190.
Hopkins, David Alan, to Valeron Corporation, The. Milling cutter. 4,093,392, Cl. 407-48.000.
Hoppe, Lutz; Boehmer, Branislav; and Behn, Rudolf, to Wolff Walsrode Aktiengesellschaft. Auxiliary agent for improving retention, drainage and treatment. 4,093,605, Cl. 260-78.0SC.
Hoppesch, Joseph P.: *See*—
Collier, Donald W.; Hoppesch, Joseph P.; and Mamo, Anthony C., 4,093,945, Cl. 340-279.000.
Horak, Anthony, to Burroughs Corporation. Disc ink ribbon. 4,093,061, Cl. 400-194.000.
Horn, Hans, to TMC Corporation. Ski brake. 4,093,267, Cl. 280-605.000.
Horner, Terry A. Static mixer and method of mixing fluids. 4,093,188, Cl. 366-336.000.
Horr, Andrew Frederick; and White, William Frederick, to International Business Machines Corporation. Alignment apparatus. 4,093,378, Cl. 355-76.000.
Horton, John P.; and LeWand, Susan H., to Newark Brush Company. Cast power brush. 4,092,758, Cl. 15-180.000.
Hosokawa, Teruo: *See*—
Nishino, Hisashi; Hosokawa, Teruo; and Hioki, Ikuo, 4,093,346, Cl. 350-162.0SF.
Hottinger, Conrad; Ruppen, Bruno; and Schaffner, Kurt, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Weapon system equipped with reloading container. 4,092,900, Cl. 89-33.00B.
Hrouda, Oldrich: *See*—
Dokoupil, Ludvik; Hrouda, Oldrich; and Zila, Josef, 4,092,757, Cl. 12-127.000.
Hrovat, Milan; and Rachor, Lothar, to Hobeg Hochtemperaturreaktor - Brennelement GmbH. Process for the production of block-shaped fuel elements for high temperature reactors. 4,093,682, Cl. 264-0.500.
Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidally-active acylated anilino-carboxylic acid esters and their compositions. 4,093,738, Cl. 424-309.000.
Hubner, Wolfgang: *See*—
Dahmen, Kurt; Hubner, Wolfgang; and Barthell, Eduard, 4,093,542, Cl. 210-54.000.
Huddle, Carl F., to Tension Structures Co.; and Vredevoogd, Jon D. Laminated arch members and method of constructing them. 4,092,992, Cl. 135-3.00R.
Hudelmaier, Gerhard; and Rudolf, Anton, to Hudelmaier, Ingrid. Apparatus for making ready-mixed concrete. 4,093,085, Cl. 214-16.00R.
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Hudson, Frederick W., to Xerox Corporation. High speed tank development system. 4,092,954, Cl. 118-658.000.
Hufford, Charles D., to University of Mississippi. Antimicrobial compositions. 4,093,717, Cl. 424-195.000.
Huggett, Richard D. J., to Lewmar Marine Limited. Shackles. 4,093,293, Cl. 294-83.00R.
Hughes Aircraft Company: *See*—
Eckhardt, Gisela; and Eckhardt, Wilfried O., 4,093,888, Cl. 313-163.000.
Evans, Norol T., 4,093,949, Cl. 343-7.00A.
Hartman, John M.; and Erb, Darrell M., 4,093,872, Cl. 307-221.00D.
Jacobson, Alexander D.; Grinberg, Jan; Braatz, Paul O.; and Bleha, William P., Jr., 4,093,357, Cl. 350-338.000.
Hughes, Charles C.: *See*—
Greenwell, Joseph Daniel; Hughes, Charles C.; and Kinney, Robert W., 4,093,207, Cl. 271-3.100.
Hughes, Gary W. Highly versatile dock trailer. 4,092,755, Cl. 9-1.200.
Hughes Microelectronics Limited: *See*—
Fowler, Albert Lewis; Walker, David Martin; Stevenson, Alastair Kershaw; and Henderson, Alan Graham, 4,092,852, Cl. 73-117.300.
Hughes, Robert T.; and Matthews, R. Hurley, to Humat, Inc. Valve. 4,093,178, Cl. 251-104.000.
Hughes, Thomas E.; and Skornschek, Thomas E. Combination jump rope and flexible exerciser. 4,093,211, Cl. 272-68.000.
Humat, Inc.: *See*—
Hughes, Robert T.; and Matthews, R. Hurley, 4,093,178, Cl. 251-104.000.
Hunley, Benjamin L.; and Packard, James C., to Hunley and Packard. Camera case. 4,093,010, Cl. 150-52.00J.
Hunley and Packard: *See*—
Hunley, Benjamin L.; and Packard, James C., 4,093,010, Cl. 150-52.00J.
Hunt, Eric, to Beecham Group Limited. β-Lactam antibiotics. 4,093,626, Cl. 260-307.0FA.
Hunt, Norman, to Associated Engineering Limited. Rotational speed transducers. 4,093,853, Cl. 250-231.0SE.
Hunter Associates Laboratory, Inc.: *See*—
Christie, John S., Jr.; Jenkins, S. Upton; and McConnell, George B., 4,093,991, Cl. 364-525.000.
Hunts, Barney Dean: *See*—
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,092,937, Cl. 112-121.110.
Hurst, Gerald L., to Tyler Holding Company. Activated ammonium nitrate explosive composition. 4,093,478, Cl. 149-2.000.
Hurvitz, Esther: *See*—
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Hurwitz, Marvin J.; and Avery, Noyes L., to Rohm and Haas Company. Aminated crosslinked copolymers of bis(chloromethyl) styrene which exhibit improved anion exchange properties. 4,093,567, Cl. 260-21.00E.
Hutcheson, Alan G.: *See*—
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Huyck Corporation: *See*—
Fleischer, Thomas B., 4,093,512, Cl. 162-348.000.
Iavarone, Anthony; and Iavarone, Richard Anthony. Vacuum packing device. 4,093,009, Cl. 150-.500.
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Iavarone, Anthony; and Iavarone, Richard Anthony, 4,093,009, Cl. 150-.500.
Ibstock Building Products Limited: *See*—
Cond, Frederick George, 4,093,685, Cl. 264-28.000.
Ichihara, Hiroo; and Ohta, Yuzuru, to Nippondenso Co., Ltd. Air filter material. 4,093,437, Cl. 55-487.000.
ICI Americas Inc.: *See*—
Kuehn, Erich, 4,093,601, Cl. 260-63.0UY.
ICN Pharmaceuticals, Inc.: *See*—
Revankar, Ganapathi R.; and Robins, Roland K., 4,093,624, Cl. 260-302.00D.
Robins, Roland K.; O'Brien, Darrell E.; and Novinson, Thomas, 4,093,617, Cl. 544-281.000.
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Idemitsu Kosan Company Limited: *See*—
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IFO AB: *See*—
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Iga, Yoshiro; and Shiga, Masashi, to Green Cross Corporation, The. Process for purifying coagulation factor VIII using DEAE-crosslinked dextran. 4,093,608, Cl. 260-112.00B.
Iida, Shonosuke. Horizontal posture maintenance structure. 4,093,166, Cl. 248-126.000.
Iiga, Tsuyoshi: *See*—
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Ikariishi, Koichi; Kondo, Kanji; and Teshiba, Tol.o, to Kawasaki Steel Corporation. Taper journal bearing for rolls for use in rolling mills. 4,093,321, Cl. 308-20.000.
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Ikeda, Akira: *See*—
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Iljunin, Vladimir Grigorievich; Kuznetsov, Igor Alexeevich; Murogov, Viktor Mikhailovich; and Shmelev, Anatoly Nikolaevich. Method of bringing nuclear power plant to fractional electrical load conditions. 4,093,514, Cl. 176-65.000.
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Imbert, Pierre, to Service D'Exploitation Industrielle des Tabacs et des Allumettes. Cigar-like product. 4,092,987, Cl. 131-8.00R.
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Imperial Chemical Industries Limited: *See—*
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Burgess, Robin Henry; and Greaves, Jeffrey Chester, 4,093,787, Cl. 526-62.000.
Davis, John Brian; Skilling, Derek; and Wrigley, Nigel Edwin, 4,093,412, Cl. 425-71.000.
Lawes, Norman Edward, 4,093,114, Cl. 220-46.200.
McGrail, Patrick Terence; Smith, Stephen Richard; Bannister, Frederick Robert; and Boutle, David Leonard, 4,093,458, Cl. 96-87.00R.
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Terry, Ruel C., 4,093,310, Cl. 299-2.000.
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Industrial Park Machine & Tool Co, Inc.: *See—*
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Industrie Pirelli S.p.A.: *See—*
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International Business Machines Corporation: *See—*
Bodner, Ronald Eugene; Crooks, Thomas Lee; and Kiscaden, Richard Craig, 4,093,986, Cl. 364-200.000.
Burgers, Gerrit, 4,093,056, Cl. 192-127.000.
Christiana, William R.; and Hevesi, Joseph F., 4,093,132, Cl. 242-7.030.
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Harris, Erik Preston; and Keyes, Robert William, 4,093,503, Cl. 156-628.000.
Heuer, Dale Arthur; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 4,093,982, Cl. 364-200.000.
Hogan, Walter John; Schwartz, Alfred Alexander; and Stewart, Joseph Robert, 4,093,996, Cl. 364-900.000.
Horr, Andrew Frederick; and White, William Frederick, 4,093,378, Cl. 355-76.000.
Knepper, Ronald William, 4,093,875, Cl. 307-251.000.
Masog, Charles Raymond; Petrie, Jerome Urban; and Mishima, Yasutsugu, 4,093,983, Cl. 364-200.000.
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International Flavors & Fragrances Inc.: *See—*
Withycombe, Donald Arthur; Mookherjee, Braja Dulal; Vock, Manfred Hugo; and Vinals, Joaquin Francisco, 4,093,752, Cl. 426-536.000.
International Omni-Pak Corporation: *See—*
Erickson, Gerald, 4,093,295, Cl. 294-87.200.
International Standard Electric Corporation: *See—*
Crick, Aubrey M., 4,093,341, Cl. 350-96.210.
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Isaacson, Anson; Morrison, Howard J.; Baer, Ralph H.; Fletchic, Donald K.; and Keller, Albert G., to Marvin Glass & Associates. Programmable record changer. 4,093,832, Cl. 179-100.40D.
Ishiguro, Tatsuo; and Suzuki, Norio, to Nippon Electric Co., Ltd. Adaptive predictive encoder. 4,093,962, Cl. 358-138.000.
Ishihara, Takeo; Yamamoto, Hitoshi; and Iiga, Tsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Speed changing position regulating device for autobicycles. 4,093,264, Cl. 280-296.000.
Ishino, Fukuya: *See—*
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Iwata, Masao; and Yoshizawa, Hisao, to Hitachi Metals, Ltd. Anisotropic permanent magnet alloy and a process for the production thereof. 4,093,477, Cl. 148-108.000.
J.P. Stevens & Co., Inc.: *See—*
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Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Copolyesters of terephthalic acid, 1,2-propanediol and 1,4-cyclohexanedimethanol. 4,093,603, Cl. 260-75.00R.
Jacob, Guy Michel, to U.S. Philips Corporation. Method for synthesis of III-V compounds. 4,093,704, Cl. 423-299.000.
Jacobs, Lawrence O'Quinn, to Plastic Products, Inc. Process and apparatus for forming pleats in a draw drape. 4,093,483, Cl. 156-227.000.
Jacobs, Richard L., to Sherwin-Williams Company, The. Production of pulp slurries employing isatoic anhydride. 4,093,509, Cl. 162-158.000.
Jacobson, Alexander D.; Grinberg, Jan; Braatz, Paul O.; and Bleha, William P., Jr., to Hughes Aircraft Company. Cermet interface for electro-optical devices. 4,093,357, Cl. 350-338.000.
Jacobson, Tord, to Telefonaktiebolaget L M Ericsson. Socket contact. 4,093,337, Cl. 339-256.00S.
Jacques, Ronald Harmon. Punching bag for practicing uppercuts. 4,093,212, Cl. 272-76.000.
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James Mackie & Sons Limited: *See—*
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Jan, David K.: *See—*
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Jansen, Martin B., Jr., to Vetco Offshore Industries, Inc. Method and apparatus for axially loading threaded connectors. 4,093,281, Cl. 285-39.000.
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Jarreau, Francois Xavier; and Koenig, Jean-Jacques, to Etablissements Nativelle S.A. Method for oxidizing cinchona alkaloids. 4,093,619, Cl. 260-284.000.
Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, to Castrol Limited. Hydraulic fluid compositions. 4,093,554, Cl. 252-78.300.
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Jeffery, Thomas C.; and Graybill, Wilmer B., to PPG Industries, Inc. Detection of liquid in a gas stream. 4,092,846, Cl. 73-29.000.
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Jin, Jung Il; and Yu, Arthur J., to Stauffer Chemical Company. Method for the preparation of polyvinyl chloride by suspension or emulsion polymerization. 4,093,788, Cl. 526-74.000.
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Johnson, Keith Trevor: *See*—
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Johnson, Kenneth Frank. Tool for bricklaying. 4,093,172, Cl. 249-19.000.
Johnson, Peter Walton, to Olin Corporation. Noise and fouling reducer for powder-actuated tool. 4,093,110, Cl. 227-9.000.
Johnson, William R., Jr.: *See*—
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Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., to Betz Laboratories, Inc. Method for treating aqueous mediums containing magnesium sulfite trihydrate. 4,093,580, Cl. 260-29.6SQ.
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Joyce, Arthur W., to Dennison Manufacturing Company. Miniaturized harnessing device. 4,092,765, Cl. 24-16.0PB.
Jung, Rolf, to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik. Cutting-out machine for flat material. 4,092,777, Cl. 30-273.000.
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Jungst, Klaus-Peter; and Ries, Gunter, to Gesellschaft fur Kernforschung m.b.H. Superconductor. 4,093,817, Cl. 174-32.000.
Jurgens, Rainer; and Ostertag, Alfred, to Christensen, Inc. Apparatus for making-up and breaking threaded pipe connections. 4,092,881, Cl. 81-57.340.
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Payne, John R., 4,093,524, Cl. 204-61.000.
Kaiser, Martin L. Delayed response transmitter indicator. 4,093,920, Cl. 325-364.000.
Kalal, Jaroslav; Zurkova, Eva; and Svec, Frantisek, to Ceskoslovanska akademie ved. Polymeric material containing aldehyde groups and the method of its preparation. 4,093,602, Cl. 260-73.00R.
Kalo Laboratories, Inc.: *See*—
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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Double salt of zinc chloride and indamines. 4,093,640, Cl. 260-429.900.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Indoanilines. 4,093,806, Cl. 544-165.000.
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Richter, Johan C. F. C., 4,093,506, Cl. 162-17.000.
Richter, Johan Christoffer Fredrik Carl, 4,093,511, Cl. 162-234.000.
Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Optical reading apparatus with scanner light intensity control. 4,093,961, Cl. 358-128.000.
Kanda, Richard, to United States of America, Army. Kilobar range stress gauge. 4,092,856, Cl. 73-141.00A.
Kandler, Joachim; Komorniczyk, Klaus; and Reitz, Mathias, to Hoechst Aktiengesellschaft. Process for inhibiting the corrosion of heavy pulps for heavy media separation of minerals. 4,093,538, Cl. 209-172.500.
Kane, William S.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,093,698, Cl. 423-24.000.
Kaneko, Ryoichi; Nii, Katutosi; Hiroyama, Hiroo; and Okano, Kinpei, to Hitachi, Ltd. Grooved spherical bearing for vertical machines. 4,093,320, Cl. 308-9.000.
Kaneko, Yoshio: *See*—
Suzuki, Yasoji; Kaneko, Yoshio; and Shiotari, Yoshihisa, 4,093,942, Cl. 340-166.00R.
Kanner, Bernard: *See*—
Schilling, Curtis L.; Prokai, Bela; and Kanner, Bernard, 4,093,642, Cl. 544-106.000.
Kantrowitz, Adrian; and Freed, Paul S., to Sinai Hospital of Detroit. Dynamic prosthetic myocardium. 4,092,742, Cl. 3-1.700.
Kao, Jar-lin; and Leonard, John Joseph, to Atlantic Richfield Company. Liquid phase oxidation of unsaturated aldehydes to carboxylic acids with a bismuth catalyst. 4,093,649, Cl. 260-530.00N.
Kao Soap Co., Ltd.: *See*—
Aoki, Shuzo; and Yamasaki, Harumasa, 4,093,776, Cl. 428-402.000.
Kaplit, Michael; Hayden, Daniel B.; and Smith, George W., to General Motors Corporation. Symmetrical internal heater for liquid crystal display. 4,093,355, Cl. 350-334.000.
Kappas, Chris S. Electric trolling motor having planetary gear reduction. 4,092,946, Cl. 115-18.00E.
Karamian, Narbik A. Method for assaying endotoxins. 4,093,381, Cl. 356-51.000.
Karetny, Zinovy Petrovich: *See*—
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.
Karinthi, Pierre: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,093,553, Cl. 252-70.000.
Karnowski, Thomas A.; and Shawaluk, Michael W., to Cutler-Hammer, Inc. Ratemeter which calculates the reciprocal of the period. 4,093,850, Cl. 235-92.0TF.
Karsh, Irving, to Bell & Howell Company. Web transporting apparatus and web cartridges. 4,093,151, Cl. 242-198.000.
Kasdan, Harvey Lee; and Mead, Donald Carleton, to Greenwood Mills, Inc. Diffraction pattern amplitude analysis for use in fabric inspection. 4,093,866, Cl. 250-563.000.
Kato, Hideo; Nishikawa, Tomoyasu; and Koshinaka, Eiichi, to Hokuriku Pharmaceutical Co., Ltd. Diazabicycloalkane derivatives. 4,093,630, Cl. 260-326.850.
Kato, Masakathu, to Elmo Company, Limited. Pinch roller moving devices for simultaneous image and sound recording cinecameras. 4,093,362, Cl. 352-27.000.
Katoh, Sadahiko, to Suntory Ltd. Automated apparatus for joining wood plates in side-by-side relation. 4,093,111, Cl. 227-26.000.
Katvala, Victor W.: *See*—
United States of America, National Aeronautics and Space Administration; Goldstein, Howard E.; Leiser, Daniel B.; and Katvala, Victor W., 4,093,771, Cl. 428-312.000.
Katysheva, Nina Vladimirovna: *See*—
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich;

Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.

Kaufman, John George. Body electrode for electro-medical use. 4,092,985, Cl. 128-303.130.

Kaufmann, Kurt, to Contraves AG. Apparatus for stripping insulation from an electrical conductor or the like. 4,092,880, Cl. 81-9.50A.

Kawamata, Tadahisa; Freire Antunes, Carlos Jorge; and de Brito Antunes, Carlos. Mold for manufacture of bodies for transporting units. 4,093,173, Cl. 249-105.000.

Kawamura, Kouji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Noise preventing means for disc brakes. 4,093,045, Cl. 188-73.500.

Kawamura, Yoshikazu; Shimoi, Akio; and Iwai, Yuichiro, to Kabushiki Kaisha Suwa Seikosha. Electronic wristwatch. 4,093,992, Cl. 364-705.000.

Kawasaki Motors Corp.: *See*—
Rosch, Hubert J., 4,093,033, Cl. 180-5.00R.

Kawasaki Steel Corporation: *See*—
Ikariishi, Koichi; Kondo, Kanji; and Teshiba, Toko, 4,093,321, Cl. 308-20.000.

Kazintsev, Timur Isaakovich: *See*—
Vasiliev, Jury Nikolaevich; Petrenko, Andrei Viktorovich; Bagrov, Georgy Nikolaevich; Gordeeva, Galina Nikolaevna; Kazintsev, Timur Isaakovich; Telegin, Vasily Dmitrievich; and Goldfain, Vitaly Naumovich, 4,093,578, Cl. 260-28.00P.

Keck, Johannes: *See*—
Kruger, Gerd; Keck, Johannes; Noll, Klaus Reinhold; Pieper, Helmut; Ziegler, Harald; Ballhause, Helmut; and Kahling, Joachim, 4,093,734, Cl. 424-274.000.

Keeling, Michael Chancey: *See*—
Gurtler, Richard Warren; Handy, Robert Maxwell; Keeling, Michael Chancey; and Lesk, Israel Arnold, 4,092,977, Cl. 126-270.000.

Keeny, Thomas R., to Molins Machine Company, Inc. Oil heated double facer platen. 4,092,915, Cl. 100-93.00P.

Keihan Rentan Kogyo Co., Ltd.: *See*—
Araki, Eimi; Sakai, Takeo; Takai, Seizaburo; and Komori, Sekiro, 4,093,425, Cl. 44-10.00F.

Kelbert, George O.: *See*—
Sterkenburg, Jon L. D.; and Kelbert, George O., 4,093,548, Cl. 210-180.000.

Keller, Albert G.: *See*—
Isaacson, Anson; Morrison, Howard J.; Baer, Ralph H.; Fletchic, Donald K.; and Keller, Albert G., 4,093,832, Cl. 179-100.40D.

Kelling, Richard C., to Raymond Lee Organization, Inc., The, a part interest. Game tracing arrow. 4,093,229, Cl. 273-106.50R.

Kelman, Arnold Lloyd; and O'Dell, William Raymond, to General Electric Company. Gantry for computed tomography. 4,093,860, Cl. 250-445.00T.

Kelman, Arnold Lloyd; and Peterson, Thomas Eben, to General Electric Company. Gantry for computed tomography. 4,093,861, Cl. 250-445.00T.

Kelman, Charles D. Intraocular lenses. 4,092,743, Cl. 3-13.000.

Keltjens, Heinz: *See*—
Miller, Hermann; and Keltjens, Heinz, 4,093,003, Cl. 137-615.000.

Kern, Georg, to Dyckerhoff & Widmann Aktiengesellschaft. Reinforcing rod. 4,092,814, Cl. 52-730.000.

Kerr, George T.; and Chester, Arthur W., to Mobil Oil Corporation. Ultra high silicon-content zeolites and preparation thereof. 4,093,560, Cl. 252-455.00Z.

Kerr-McGee Chemical Corporation: *See*—
Thomas, David Charles, 4,092,848, Cl. 73-86.000.

Kerr-McGee Corporation: *See*—
Eberline, Howard C.; and Moon, Jack L., 4,093,936, Cl. 340-18.0CM.

Kersting, Emil F.: *See*—
Hansen, Manfred W.; and Kersting, Emil F., 4,092,891, Cl. 83-341.000.

Kesler, George H.: *See*—
Loest, Kent W.; and Kesler, George H., 4,093,700, Cl. 423-120.000.

Kessel, Bernhard. Odor trap for drain. 4,092,747, Cl. 4-286.000.

Ketcham, Ferris F. Ocular fixation aid. 4,093,359, Cl. 351-1.000.

Kewley, Norman E.; and Smetana, Andrew, to General Electric Company. Multiple flash array. 4,093,979, Cl. 362-5.000.

Keyes, Robert William: *See*—
Harris, Erik Preston; and Keyes, Robert William, 4,093,503, Cl. 156-628.000.

Kiefer, John. Method of making a hardcore honeycomb panel and honeycomb panel made thereby. 4,093,762, Cl. 428-55.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000

Kile, Stephen A.; and Jones, Rufus V., to Phillips Petroleum Company. Armored conduit. 4,093,004, Cl. 138-140.000.

Kilgore, Lee A.: *See*—
Hoffmann, Arthur H.; Gorden, Dale I.; and Kilgore, Lee A., 4,093,869, Cl. 290-31.000.

Killpatrick, Don H.: *See*—
Marchant, David D.; and Killpatrick, Don H., 4,093,879, Cl. 310-11.000.

Kimball, David V., to Kimball Industries, Inc. Slip plate assembly for vibration testing through temperature extreme thermal cycling. 4,092,869, Cl. 73-665.000.

Kimball Industries, Inc.: *See*—
Kimball, David V., 4,092,869, Cl. 73-665.000.

Kimoto, Kyoji: *See*—
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; and Yokoyama, Shigeo, 4,093,568, Cl. 260-2.20R.

Kincaid, Elmo, Jr. Steam powered tilting engine VTOL airplane. 4,093,155, Cl. 244-12.400.

Kincaid, John E. Cabinet door mounting bracket. 4,093,202, Cl. 269-321.00S.

Kindelan, James J., to Overmyer Mould Company of Pennsylvania. Linear slide and swivel arrangement for a die mold lathe. 4,092,883, Cl. 82-3.000.

King, Ellwood J. Lathe adapter for non-standard thread machining. 4,092,884, Cl. 82-5.000.

King, Gerard J.; and Martino, Joseph F., to United States of America, Army. SOS extrinsic infrared detector and read-out device. 4,093,957, Cl. 357-24.000.

King Radio Corporation: *See*—
Ewy, Robert J.; and Moore, Robert P., 4,093,836, Cl. 200-61.530.

Kinney, Lionel L., to Caterpillar Tractor Co. Dynamometer and coupling for a test stand. 4,092,855, Cl. 73-134.000.

Kinney, Robert W.: *See*—
Greenwell, Joseph Daniel; Hughes, Charles C.; and Kinney, Robert W., 4,093,207, Cl. 271-3.100.

Kinsner, Witold; and Della Torre, Edward, to Canadian Patents and Development Limited. Sonic magnetic domain sensor. 4,094,003, Cl. 365-7.000.

Kirsch, Kurt; Hilzensauer, Volkmar; Pflug, Gunther; Wehrmann, Felix; and Maresch, Gerald, to Isovolta Osterreichische Isolierstoffwerk Aktiengesellschaft. Process for the production of building material elements, particularly building boards. 4,093,488, Cl. 156-245.000.

Kiscaden, Richard Craig: *See*—
Bodner, Ronald Eugene; Crooks, Thomas Lee; and Kiscaden, Richard Craig, 4,093,986, Cl. 364-200.000.

Kishida, Katsuhiro; and Oyamada, Akira, to Nissan Motor Company Limited. Rubbing contact seal member with low wear coating and metal-containing undercoat. 4,093,243, Cl. 277-96.200.

Kishimoto, Yoshi, to Matsushita Electric Industrial Co., Ltd. Polymeric compositions for manufacture of secondary electron multiplier tubes and method for manufacture thereof. 4,093,562, Cl. 252-511.000.

Kissel, Ernst: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.

Kissick, Thomas P.: *See*—
Wade, Peter C.; and Kissick, Thomas P., 4,093,728, Cl. 424-269.000.

Klancnik, Alvin R., to Sealy, Incorporated. Mattress spring unit construction. 4,092,749, Cl. 5-267.000.

Klauke, Erich; and Buttner, Gerhard, to Bayer Aktiengesellschaft. Method for preparing trichloromethyl-trifluoromethyl-benzenes. 4,093,669, Cl. 260-651.00F.

Klaus, Karl-Heinz, to Spiegelglaswerke Germania, Zweigniederlassung der Glaceries de Saint.Roch S.A. Apparatus for stacking and unstacking sheet material, more particularly glass sheets. 4,093,083, Cl. 214-7.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. 3,5-Ditertiary alkyl-4-hydroxyphenyl (alkyl) 6-acyloxy-4-thia hexanoates and hexenamides as antioxidants. 4,093,591, Cl. 260-45.85H.

Kling, Gary Marvin: *See*—
Coker, Charles Milton; and Kling, Gary Marvin, 4,093,213, Cl. 272-118.000.

Klink, Wolf-Dieter, to REPA GmbH Feinstanzwerk. Self-locking belt winding device. 4,093,145, Cl. 242-107.40A.

Klose, Karl, to U.S. Philips Corporation. Light-beam deflection system. 4,093,340, Cl. 350-6.500.

Klyamov, Kostadin Spirov: *See*—
Genchev, Lyubomir Nikolov; Kafedjiev, Iliya Chudomirov; and Klyamov, Kostadin Spirov, 4,092,910, Cl. 99-472.000.

Knepper, Ronald William, to International Business Machines Corporation. Field effect transistor (FET) circuit utilizing substrate potential for turning off depletion mode devices. 4,093,875, Cl. 307-251.000.

Knight, Webster B. Sequential power distribution circuit. 4,093,943, Cl. 340-220.000.

Knofel, Hartmut; and Ellendt, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyamines. 4,093,658, Cl. 260-570.00D.

Knowles, Warren Dean, to Singer Company, The. Tension disc assembly. 4,092,939, Cl. 112-254.000.

Knutson, Glenn C. Irrigation tower drive. 4,093,036, Cl. 180-70.00R.

Kobayashi, Maasaki; Prelec, Krsto; and Sluyters, Theodorus J, to United States of America, Energy. Cesium injection system for negative ion duoplasmatrons. 4,093,858, Cl. 250-424.000.

Kober, Kasimir, to Chicago Dryer Company. French folder construction. 4,093,205, Cl. 270-66.000.

Koci, Zdenek: *See*—
Defago, Raymond; and Koci, Zdenek, 4,093,415, Cl. 8-2.50A.

Kock, Arne Karl. Water dispensing apparatus. 4,092,996, Cl. 137-344.000.

Koenig, Jean-Jacques: *See*—
Jarreau, Francois Xavier; and Koenig, Jean-Jacques, 4,093,619, Cl. 260-284.000.

Kohler Co.: *See*—
Fenton, Alvin P., 4,093,931, Cl. 335-272.000.

Kohori, Kiyotaka. Center for lathes. 4,092,885, Cl. 82-33.00R.

Kojima, Takakazu; and Ohtsuka, Yozo, to Sagami Chemical Research Center. Process for producing 4-carboxamido-5-cyano-2-imidazolone. 4,093,810, Cl. 548-321.000.

Kolesov, Vladimir Mikhailovich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Koller, Konrad; and Lauther, Ulrich, to Siemens Aktiengesellschaft. Method for the production of mask patterns for integrated semiconductor circuits. 4,093,990, Cl. 364-520.000.

Kolobow, Theodor, to United States of America, United States. Laminated carbon-containing silicone rubber membrane for use in membrane artificial lung. 4,093,515, Cl. 195-1.800.

Kolodziejczyk, Pawel: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Komai, Takeshi; Matsushima, Masaru; and Nakajima, Takeshi, to Nihon Yushi Co., Ltd. 1,1-Bis(tert-butylperoxy)cyclododecane. 4,093,786, Cl. 526-57.000.

Komatsu, Tadaaki: *See—*
Ozawa, Masahiro; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,093,670, Cl. 260-653.10R.

Komori, Sekiro: *See—*
Araki, Eimi; Sakai, Takeo; Takai, Seizaburo; and Komori, Sekiro, 4,093,425, Cl. 44-10.00F.

Komorniczyk, Klaus: *See—*
Kandler, Joachim; Komorniczyk, Klaus; and Reitz, Mathias, 4,093,538, Cl. 209-172.500.

Kondo, Kanji: *See—*
Ikariishi, Koichi; Kondo, Kanji; and Teshiba, Toko, 4,093,321, Cl. 308-20.000.

Konig, Hans-Bodo: *See—*
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,093,722, Cl. 424-246.000.

Konishiroku Photo Ind., Ltd.: *See—*
Hermann, Hansjurg, 4,093,456, Cl. 96-1.0PE.

Konno, Ryozo; Ikeda, Akira; Ugai, Toshimitsu; and Hirose, Akio, to Toyo Ink Manufacturing Co., Ltd. Photocurable resin compositions. 4,093,577, Cl. 260-22.0CB.

Kooi, John H.: *See—*
Schure, Ralph M.; Kooi, John H.; and Brown, John M., 4,093,675, Cl. 260-835.000.

Koontz, Donald Eldridge; and Landau, Uziel, to Bell Telephone Laboratories, Incorporated. Process for gold plating. 4,093,520, Cl. 204-15.000.

Kopis, Floyd B. Meniscus forming applicator including vacuum anti drip. 4,092,951, Cl. 118-50.000.

Koppers Company, Inc.: *See—*
Prew, Stanley Robert, 4,093,130, Cl. 241-245.000.

Kopse, Odon: *See—*
Hofer, Gerald; Eheim, Franz; and Kopse, Odon, 4,092,964, Cl. 123-139.0AT.

Koshinaka, Eiichi: *See—*
Kato, Hideo; Nishikawa, Tomoyasu; and Koshinaka, Eiichi, 4,093,630, Cl. 260-326.850.

Koskuba, Karel, to Stork-Werkspoor Diesel B.V. Slide bearing for use in a combustion engine and engine equipped with such a bearing. 4,093,322, Cl. 308-23.000.

Kossuth, Andrzej: *See—*
Augustyn, Wladyslaw; Dziegielewska, Maria; and Kossuth, Andrzej, 4,093,706, Cl. 423-490.000.

Koster, Frederick Henry, to American Telephone and Telegraph Inc. Tone signaling conversion apparatus. 4,093,826, Cl. 179-16.0EC.

Kotlarz, Joseph C. Combined solar energy conversion and structural and mechanical beam and structures built therefrom. 4,092,979, Cl. 126-271.000.

Koutsky, L. John: *See—*
Carter, John W.; and Koutsky, L. John, 4,093,197, Cl. 267-131.000.

Kovalevich, Evgeny Vladimirovich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Kowa Company Ltd.: *See—*
Oda, Takeshi; Mori, Toshito; and Yamaguchi, Takashi, 4,093,797, Cl. 536-17.000.

Koyama, Mikihiro; and Watanabe, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Front fork for two-wheeled vehicles. 4,093,262, Cl. 280-279.000.

Kozacka, Frederick J., to Gould Inc. Electric all purpose fuse. 4,093,932, Cl. 337-161.000.

Kozakai, Asao, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake pressure control device. 4,093,314, Cl. 303-24.00F.

Kraft, Philip O.: *See—*
Hammons, Carl A.; and Kraft, Philip O., 4,093,953, Cl. 343-225.000.

Kraft Systems, Inc.: *See—*
Hammons, Carl A.; and Kraft, Philip O., 4,093,953, Cl. 343-225.000.

Kraska, John L., to National Can Corporation. End panel for containers. 4,093,102, Cl. 220-67.000.

Kraus, Gerard; Stacy, Carl J.; and Cheng, Paul J., to Phillips Petroleum Company. Control of carbon black production. 4,093,705, Cl. 423-450.000.

Kraus, Max H.: *See—*
Cassidy, John E.; and Kraus, Max H., 4,093,193, Cl. 266-87.000.

Krause, Ruben L.: *See—*
Ham, George E.; and Krause, Ruben L., 4,093,615, Cl. 260-239.0BC.

Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik: *See—*
Jung, Rolf, 4,092,777, Cl. 30-273.000.

Kreitzberg, Ernest A., to Allis-Chalmers Corporation. Hydraulic control system for power shift transmission. 4,093,051, Cl. 192-87.130.

Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolylimidazolidinones. 4,093,443, Cl. 71-90.000.

Kretschmer, Paul. Fastening arrangement for decorative wheel rings. 4,093,312, Cl. 301-37.00R.

Krippner, Kenneth E.: *See—*
Davis, Gregory A.; Krippner, Kenneth E.; Roestel, Jan A.; Vonk, Gottfried; and Zacher, Albert R., Jr., 4,093,859, Cl. 250-445.00T.

Krob, Erwin; and Svoboda, Josef, to TMC Corporation. Safety ski binding. 4,093,270, Cl. 280-626.000.

Kruger, Gerd; Keck, Johannes; Noll, Klaus Reinhold; Pieper, Helmut; Ziegler, Harald; Ballhause, Helmut; and Kahling, Joachim, to Boehringer Ingelheim GmbH. Amino-benzoic acid amides. 4,093,734, Cl. 424-274.000.

Kruger, Johann: *See—*
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, 4,094,013, Cl. 365-234.000.
Pepperl, Rudiger; Kruger, Johann; and Hill, Bernhard, 4,094,010, Cl. 365-215.000.

Kubota Ltd.: *See—*
Uyama, Noboru; and Hara, Katsuaki, 4,093,032, Cl. 177-165.000.
Yoshizawa, Tadao; and Kadowaki, Saburo, 4,093,280, Cl. 285-39.000.

Kuehn, Erich, to ICI Americas Inc. Vinyl esters of tetracarboxylic acids and resins derived therefrom. 4,093,601, Cl. 260-63.0UY.

Kuhfuss, Herbert F.: *See—*
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,093,603, Cl. 260-75.00R.

Kuhla, Donald E., to Pfizer Inc. Quaternary salts as hypoglycemic agents. 4,093,616, Cl. 544-344.000.

Kukolja, Stjepan, to Eli Lilly and Company. Process for preparing cepham compounds. 4,093,800, Cl. 544-16.000.

Kulikov, Vasily Ivanovich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Kume, Kazunari; Watanabe, Minoru; Oono, Hideshi; and Tamaru, Munetaka, to Citizen Watch Company Limited. Electronic timepiece. 4,092,820, Cl. 58-23.00R.

Kumura, Noriharu: *See—*
Hamanaka, Michito; Sano, Toshio; and Kumura, Noriharu, 4,093,518, Cl. 195-142.000.

Kunz, Alfred: *See—*
Feist, Wieland; Junghanns, Klaus; and Kunz, Alfred, 4,093,383, Cl. 356-152.000.

Kuroda, Nobuyuki; Nakamura, Toru; Shiraishi, Takeichi; Matsuura, Kazuo; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,093,789, Cl. 526-114.000.

Kurohiji, Sinichi; Shigyo, Genshichi; and Arai, Nobujiro, to Magster Company. Mobile shot blasting apparatus for shot blasting the bottom of a ship or the like. 4,092,942, Cl. 114-222.000.

Kurtz, Robert L., to United States of America, National Aeronautics and Space Administration. Hybrid holographic non-destructive test system. 4,093,382, Cl. 356-72.000.

Kuxenko, Jury Grigorievich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.

Kuznetsov, Igor Alexeevich: *See—*
Iljunin, Vladimir Grigorievich; Kuznetsov, Igor Alexeevich; Murogov, Viktor Mikhailovich; and Shmelev, Anatoly Nikolaevich, 4,093,514, Cl. 176-65.000.

Kwok, Samuel W. T. Movable door for a vehicle. 4,093,301, Cl. 296-23.0MC.

Kyncl, Jaroslav: *See—*
Winn, Martin; and Kyncl, Jaroslav, 4,093,726, Cl. 424-250.000.

Kyoto Ceramic Co., Ltd.: *See—*
Hirabayashi, Masaya; Omi, Naoki; Nakano, Yuji; and Oshiba, Tetsuro, 4,093,502, Cl. 156-624.000.

Kyriakodis, George H. Hose clamp. 4,093,282, Cl. 285-114.000.

Kyushu Refractories Co., Ltd.: *See—*
Nishikawa, Yasuo; Watanabe, Akira; Sugimoto, Tetsuya; Yabuki, Kazuyasu; and Hatayama, Yoshio, 4,093,561, Cl. 252-466.00J.

Labofina S.A.: *See—*
Bracke, William J. I., 4,093,790, Cl. 526-144.000.
Labrecque, Jean P., to United States of America, Navy. Oil level indicator for use with damping fluid metering pins. 4,092,947, Cl. 116-118.00R.
Laely, Andreas: *See—*
Zwahlen, Gunther; Umsonst, Gerhard; and Laely, Andreas, 4,093,584, Cl. 260-40.00P.
Laiho, Erkki: *See—*
Honkanen, Arto; and Laiho, Erkki, 4,093,486, Cl. 156-244.190.
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Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,093,553, Cl. 252-70.000.
Laitram Corporation, The: *See—*
Fowler, John T., 4,093,946, Cl. 340-310.00R.
Lake, Royston Ernest Walter: *See—*
Olive, Graham; Lake, Royston Ernest Walter; and Dionne, Joseph Guy Gilles, 4,093,852, Cl. 250-213.00A.
Lalikos, James M.; and Waite, Harold K., to Titeflex, a division of Atlas Corporation. Apparatus for weaving braided-wire sheathing including means for twisting bundled strands to equalize tension. 4,092,897, Cl. 87-29.000.
Lamarche, Jean Luc, to Thomson-CSF. System for advancing an electrical signal in phase under the control of an external voltage more especially for an engine of a motor vehicle. 4,093,926, Cl. 331-11.000.
Lamberti, Vincent; and Gutierrez, Eddie Nelson, to Lever Brothers Company. Anhydrides of carboxymethyloxysuccinic acid. 4,093,634, Cl. 260-346.740.
Lamport, Ivan Richard: *See—*
Muntjanoff, John Richard; and Lamport, Ivan Richard, 4,093,241, Cl. 277-24.000.
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., to Polaroid Corporation. Method of making a flanged fluted self-coiling sheet. 4,093,696, Cl. 264-295.000.
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, to Singer Company, The. Automatic stitching by programmable sewing machine. 4,092,937, Cl. 112-121.110.
Landau, Uziel: *See—*
Koontz, Donald Eldridge; and Landau, Uziel, 4,093,520, Cl. 204-15.000.
Landgraf, Glenn A.; and Ebel, Fred H., to Irvin Industries, Inc. Sheet cutter, folder and stacker. 4,093,204, Cl. 270-21.000.
Lang, John L. Preparation of liquid fuel and nutrients from municipal waste water. 4,093,516, Cl. 195-27.000.
Lang, Kenneth T., to Honeywell Inc. Optical radiation limiter. 4,093,353, Cl. 350-313.000.
Lapidus, Stanley N., to Raytheon Company. Radiographic normalizing system. 4,093,857, Cl. 250-369.000.
Larsson, Bertil Ivar, to Elektromekano i Bredaryd AB. Switch for rail points. 4,093,163, Cl. 246-476.000.
La Russa, Joseph A., to Farrand Optical Co., Inc. Optical simulation apparatus using controllable real-life element. 4,093,347, Cl. 350-174.000.
Laudermilch, John R.: *See—*
Hill, Howard D. W.; and Laudermilch, John R., 4,093,911, Cl. 324-.5AH.
Laurent, Roger, to POMA 2000 S.A. Transport installation with triple grip for coupling the vehicles to haulage cables. 4,092,929, Cl. 104-173.00R.
Laursen, Einar Munk, to Memofax A/S. Copy sheet suitable for thermocopying. 4,093,767, Cl. 428-194.000.
Lauther, Ulrich: *See—*
Koller, Konrad; and Lauther, Ulrich, 4,093,990, Cl. 364-520.000.
Lawes, Norman Edward, to Imperial Chemical Industries Limited. Plastics bag. 4,093,114, Cl. 220-46.200.
Lawson-Hemphill, Inc.: *See—*
Lawson, John B., 4,092,857, Cl. 73-144.000.
Lawson, John B., to Lawson-Hemphill, Inc. Tensiometer. 4,092,857, Cl. 73-144.000.
Ledeen Flow Control Systems Inc.: *See—*
Ledeen, Howard L.; Schmon, Franz; and Tupker, Willem E., 4,092,877, Cl. 74-625.000.
Ledeen, Howard L.; Schmon, Franz; and Tupker, Willem E., to Ledeen Flow Control Systems Inc. Selective mode handwheel valve operator. 4,092,877, Cl. 74-625.000.
Le Donne, Daniel A.: *See—*
Schwartz, Oscar H.; and Le Donne, Daniel A., 4,093,335, Cl. 339-177.00E.
Lee, Jimmy D. Apparatus for applying foamed material in-place to surfaces. 4,093,411, Cl. 425-64.000.
Lee, Wooyoung: *See—*
Gross, Benjamin; and Lee, Wooyoung, 4,093,537, Cl. 208-164.000.
Leeb, Walter Robert: *See—*
United States of America, National Aeronautics and Space Administration; and Leeb, Walter Robert, 4,093,354, Cl. 350-320.000.
Leezer, James R., to Pillsbury Company, The. Fiber can dough package with kraft paper body and peelable label. 4,093,073, Cl. 206-606.000.
Leff, Martin J., to S&S Corrugated Paper Machinery Co., Inc. Self retracting stripper finger for corrugating machine. 4,093,497, Cl. 156-473.000.
Legacy, Donald J.: *See—*
Browning, William W.; and Legacy, Donald J., 4,092,768, Cl. 29-156.80R.
Leggeter, Brian Ernest: *See—*
Davidson, Hugh; Johnson, Keith Trevor; Leggeter, Brian Ernest; and Moore, Anthony John, 4,093,645, Cl. 260-505.00C.
Lehigh Valley Industries, Inc.: *See—*
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Lehr, Josef, to Daimler-Benz Aktiengesellschaft. Chassis frame for motor vehicles. 4,093,253, Cl. 280-789.000.
Leighton, Leroy G., to General Electric Company. Stay-on lamp. 4,093,894, Cl. 315-64.000.
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Lekarev, Zinovy Abramovich: *See—*
Suslin, Vladimir Isaakovich; Dubovik, Alexandr Ivanovich; Makeev, Boris Anatolievich; Razdymakha, Pavel Semenovich; and Lekarev, Zinovy Abramovich, 4,093,530, Cl. 204-224.00M.
Lemelson, Jerome H. Method for making composite articles. 4,093,693, Cl. 264-171.000.
Lemke, Charles H.: *See—*
Clare, Norval D.; and Lemke, Charles H., 4,093,194, Cl. 266-122.000.
Leonard, John Joseph: *See—*
Kao, Jar-lin; and Leonard, John Joseph, 4,093,649, Cl. 260-530.00N.
Leroy, Pierre Jean: *See—*
Sprunck, Emile; and Leroy, Pierre Jean, 4,093,190, Cl. 266-47.000.
LeRoy, Rodney Lash, to Noranda Mines Limited. Treatment of zinc surfaces to inhibit wet storage staining and products employed therein. 4,093,780, Cl. 428-458.000.
Lesk, Israel Arnold: *See—*
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Lever Brothers Company: *See—*
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Sen Gupta, Achintya Kumar, 4,093,540, Cl. 210-23.00F.
Levine, Jeffrey Steven, to Massachusetts Institute of Technology. Pulsed gas laser. 4,093,927, Cl. 331-94.5PE.
Levine, Richard S. Solar energy collector. 4,092,978, Cl. 126-270.000.
LeWand, Susan H.: *See—*
Horton, John P.; and LeWand, Susan H., 4,092,758, Cl. 15-180.000.
Lewiner, Jacques: *See—*
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Lewis, Dyfed: *See—*
Fahnenstich, Rudolf; Heese, Joachim; and Lewis, Dyfed, 4,093,740, Cl. 424-319.000.
Lewis, James Cyril Alexander: *See—*
Carter, Christopher Frederick; Blunt, Roy Trevor; Lewis, James Cyril Alexander; and Garner, Geoffrey Michael, 4,093,534, Cl. 350-355.000.
Lewis, Nathanial H. Bike traction attachment. 4,093,013, Cl. 152-240.000.
Lewmar Marine Limited: *See—*
Huggett, Richard D. J., 4,093,293, Cl. 294-83.00R.
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Scher, Herbert I.; Lex, Joseph A.; and Ungar, Israel S., 4,093,766, Cl. 428-165.000.
Libianchi, Giulio Cesare, to Autovox S.p.A. Device for clamping and ejecting from a container an autoradio or the like. 4,093,328, Cl. 312-333.000.
Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Mayer, Gyorgy; Gyori, Janos; Rikker, Mihaly; Banfai, Antal; and Eszenyl, Ervin, 4,093,689, Cl. 264-71.000.
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Nutz, Karl-Diether, 4,093,907, Cl. 323-1.000.
Tauber, Manfred; and Heuer, Dieter, 4,093,419, Cl. 21-102.00R.
Lienau, Jeffrey A., to United States of America, Army. Rear gate peep sight device. 4,092,899, Cl. 89-1.816.
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Alberts, Albert K.; and Jolley, Weldon B., 4,093,127, Cl. 241-55.000.
Lignes Telegraphiques et Telephoniques: *See—*
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Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., to Research Corporation. 5-Iodo-5'-amino-2',5'-dideoxycytidine and the pharmaceutically acceptable salts thereof. 4,093,715, Cl. 424-180.000.
Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., to Research Corporation. Compositions containing 5-amino-5-deoxythymidine and pharmaceutically acceptable salts thereof. 4,093,716, Cl. 424-180.000.
Lin, Tung-Yen; and Yang, Yue-Chyou, to T. Y. Lin International. Cooling tower, construction method therefor and precast prestressed concrete building units. 4,092,811, Cl. 52-224.000.
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Eichorn, Roger H., deceased; Lincoln First Bank of Rochester, executor; and Silverberg, Morton, 4,093,367, Cl. 355-3.00R.
Lindemann, Klaus; Weise, Lutz; and Reinecke, Erich, to WABCO Westinghouse GmbH. Vehicle antiskid brake control system having means for adjusting a non-sensed wheel brake pressure relative to a sensed wheel brake pressure. 4,093,317, Cl. 303-111.000.
Linderman, Duane L.; and Hom, Felix, to Rohr Industries, Inc. Integrated divergent exhaust nozzle thrust reverser. 4,093,122, Cl. 239-127.300.
Lindmayer, Joseph. Solar panel with UV absorber. 4,093,473, Cl. 136-89.00P.

Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., to Lindsey Manufacturing Company. Unitary grounding assembly for bundle conductor stringing blocks. 4,093,183, Cl. 254-134.3PA.
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Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., 4,093,183, Cl. 254-134.3PA.
Lindskog, Per Folke: *See*—
Svensson, Lars-Erik; Tengzelius, Jan Robert; and Lindskog, Per Folke, 4,093,449, Cl. 75-0.50R.
Lindstrom, George Adam; and Holland, Robert Charles, to Union Carbide Corporation. Electron beam welding machine. 4,093,843, Cl. 219-121.0EB.
Linge, Hermann: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.
Linger, Harrison K., to General Electric Company. Hand grip assembly for movable cabinet. 4,093,327, Cl. 312-244.000.
Link, Christoph; and Stotz, Wolf-Gunter, to Escher Wyss Limited. Controlled-deflection roll. 4,092,916, Cl. 100-174.000.
Linner, Hans Rolf Ingemar, to AB Akerlund & Rausing. Carton flap folding mechanism. 4,092,906, Cl. 93-49.00R.
Lintott, Edward Robert, to Lucas Industries Limited. Pump control devices. 4,092,965, Cl. 123-140.0FG.
Lionetti, James: *See*—
Argentieri, Michael A.; and Lionetti, James, 4,093,938, Cl. 340-27.00R.
Liptak, Gabor; and Schuler, Roland, to BBC Brown Boveri & Company Limited. Arrangement for supporting winding elements in the stator slots of a dynamo-electric machine. 4,093,881, Cl. 310-214.000.
List, Hans; Skatsche, Othmar; Greier, Josef; Obermayer, Bertram; Feichtinger, Gerhard; and Wagner, Johann, to List, Hans. Water cooled internal combustion engine, particularly a diesel engine. 4,092,956, Cl. 123-41.740.
Little, Eric A.: *See*—
Morris, Donald A.; Wilson, Eddie A.; and Little, Eric A., 4,092,804, Cl. 47-66.000.
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Barnak, John A., 4,092,920, Cl. 101-77.000.
Lloyd, Albert Ivor, to United Kingdom Atomic Energy Authority. Freeze separation plant. 4,092,834, Cl. 62-123.000.
Lo, Young-Sek: *See*—
Commons, Thomas J.; Sheehan, John C.; and Lo, Young-Sek, 4,093,625, Cl. 260-306.70C.
Lockwood, George C.; and Aneshansley, Nicholas E., to NCR Corporation. Alterable capacitor memory array. 4,094,008, Cl. 365-149.000.
Loctite Corporation: *See*—
Wojciak, Stanley, 4,093,556, Cl. 252-316.000.
Loest, Kent W.; and Kesler, George H., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Process for reduction of alunite ore in aluminum recovery process. 4,093,700, Cl. 423-120.000.
Loewe, Henri, to Societe Francaise des Echafaudages Self-Lock. Travelling support for scaffolding. 4,092,760, Cl. 16-35.00R.
Loftus, John M.: *See*—
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Logan, Ralph Andre; Reinhart, Franz Karl; and Sinclair, William Robert, to Bell Telephone Laboratories, Incorporated. Semiconductor rib waveguide optical modulator with heterojunction control electrode cladding. 4,093,345, Cl. 350-355.000.
Logvinenko, Dmitry Danilovich: *See*—
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.
Long, William H., III, to Westinghouse Electric Corp. Target detection in a medium pulse repetition frequency pulse doppler radar. 4,093,948, Cl. 343-7.00A.
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Loprest, Frank J.; and McInerney, Eugene F., to GAF Corporation. Positive working thermally stable photoresist composition, article and method of using. 4,093,461, Cl. 96-36.000.
L'Oreal: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,640, Cl. 260-429.900.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,093,806, Cl. 544-165.000.
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Abbruzzese, Luigi; Gozzo, Franco; Rossi, Giorgio; Masoero, Marcella; Lorusso, Simone; Bonola, Paola; and Tamburin, Gino, 4,093,727, Cl. 424-258.000.
Lovelady, Grady R. High vacuum pump. 4,093,397, Cl. 415-53.00R.
Loxley, Ted A.: *See*—
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Lubojatsky, Walter; and Wertelewski, Wilhelm, to Becorit Grubenausbau GmbH. Roof bar for surface support elements. 4,092,831, Cl. 61-45.00D.
Lucas Industries Limited: *See*—
Lintott, Edward Robert, 4,092,965, Cl. 123-140.0FG.
Lucas, Lester Wade; and Albers, William Marion, to Wetterau Incorporated. Warehousing system. 4,093,086, Cl. 214-16.40A.
Ludvik, George F. Device for cutting yarn. 4,093,200, Cl. 269-295.000.
Ludwig Bertram GmbH & Co. KG, Firma: *See*—
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Luebbert, William K.; Blankenship, Thomas O.; and Freeman, Roy H., to McDonnell Douglas Corporation. Drill and combined drill countersink. 4,093,395, Cl. 408-224.000.
Lukac, Frederick S.; and Zbryski, William P., to Allegheny Ludlum Industries, Inc. Apparatus for cleaning strip. 4,093,472, Cl. 134-104.000.
Lund, Norman; and Young, George R. Marine protection system. 4,092,943, Cl. 114-222.000.
Lundgren, Stig Gunnar; and Tornell, Lars Johan. Device for application of liquid products, such as paint, glue and the like. 4,093,386, Cl. 401-219.000.
Lurssen, Klaus: *See*—
Metzger, Carl; Jager, Gerhard; and Lurssen, Klaus, 4,093,447, Cl. 71-111.000.
Lutravil Spinnvlies GmbH & Co.: *See*—
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Lyass, Abram Moiseevich; Zhukovsky, Sergei Semenovich; and Teplyakov, Sergei Dmitrievich. Method for making foundry moulds and cores. 4,093,467, Cl. 106-38.350.
Lynch, Charles R.; and Wheeler, Robert A., to Texaco Inc. Flash point analyzing means and method. 4,092,847, Cl. 73-36.000.
Maahs, Paul F.: *See*—
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Maas, Edward T., Jr.; Longo, John M.; and Chang, Chin H., to Exxon Research and Engineering Company. Novel formulations $M_3UO_2F_5$ and their use in electrochemical cells. 4,093,783, Cl. 429-5.000.
Maass, Hans: *See*—
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MacArthur, Robert I., to General Motors Corporation. Tie rod assembly for vehicles. 4,093,388, Cl. 403-46.000.
MacDonnell, Robert W., to R. W. Mac Company. Replaceable bolster gib arrangement. 4,092,932, Cl. 105-207.000.
Mack and Gooding: *See*—
Harris, Richard, 4,092,746, Cl. 4-172.170.
Mackie, Gordon, to James Mackie & Sons Limited. Textile, yarn or tape winding machines. 4,093,136, Cl. 242-45.000.
MacNamara, Elizabeth L.; and Pearlstein, Fred, to United States of America, Army. Phosphate-free spray cleaner for metals. 4,093,566, Cl. 252-527.000.
Magistretti, Maria Jose: *See*—
Sianesi, Enrico; Bonola, Giuseppe; Setnikar, Ivo; and Magistretti, Maria Jose, 4,093,648, Cl. 260-519.000.
Magster Company: *See*—
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Majesky, Paul D.: *See*—
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Makeev, Boris Anatolievich: *See*—
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Makino, Yoshimi; Uedaira, Satoru; and Ito, Shigeyasu, to Sony Corporation. Method of making an ordered alloy. 4,093,453, Cl. 75-129.000.
Malinski, S. W. Method of mounting large pneumatic tires. 4,093,015, Cl. 157-1.100.
Mallozzi, Joseph P.: *See*—
Shah, Mahesh J.; and Mallozzi, Joseph P., 4,093,867, Cl. 250-576.000.
Maloney, John E., Jr.; and Zaccagni, Richard F., to ZMC, Inc. Combination eaves trough and fascia with soffit connection means, and method of making same. 4,092,808, Cl. 52-11.000.
Mamo, Anthony C.: *See*—
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Maniere, Maurice, to Lignes Telegraphiques et Telephoniques. System and equipment for quality checking of a digital connection circuit. 4,093,940, Cl. 340-146.10E.
Mannesmann Aktiengesellschaft: *See*—
Miller, Hermann; and Keltjens, Heinz, 4,093,003, Cl. 137-615.000.
Mannik, Kallis H.: *See*—
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Manning, John I. Method and system utilizing steam turbine and heat pump. 4,093,868, Cl. 290-2.000.
Mansson, Ragnar: *See*—
Berens, Tadeusz; and Mansson, Ragnar, 4,093,513, Cl. 176-37.000.
Manzonelli, Carmen C.; and Tessandori, Joseph L., to National Steel Corporation. Method of casting aluminum base alloy sheet and product. 4,093,475, Cl. 148-32.000.
Maran, Victor J., to Dispenser Corporation. Airless sprayer and pressurizing system. 4,093,123, Cl. 239-322.000.
Marcet, Jose Maria Maso; and Peradejordi Guanabens, Jose de Calasanz. Sling and its method of manufacture. 4,093,292, Cl. 294-74.000.
Marchant, David D.; and Killpatrick, Don H., to United States of America, Energy. Magnetohydrodynamic electrode. 4,093,879, Cl. 310-11.000.

Maresch, Gerald: *See—*
Kirsch, Kurt; Hilzensauer, Volkmar; Pflug, Gunther; Wehrmann, Felix; and Maresch, Gerald, 4,093,488, Cl. 156-245.000.
Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Organo phosphorus ester plasticized polycarbonate composition. 4,093,582, Cl. 260-30.60R.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,093,590, Cl. 260-45.85S.
Mark, Victor: *See—*
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Markowski, Walter J.: *See—*
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Maron, Ruth: *See—*
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Marron, Albert J.; and Markowski, Walter J., to Wing Industries Inc. Total heat energy exchangers. 4,093,435, Cl. 55-269.000.
Marshall Richards Barcro Limited: *See—*
Uhlmann, Otto; and Stephan, Norbert, 4,092,875, Cl. 72-275.000.
Martin, George F.: *See—*
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Martin, Lino. Screw driver having capped handle with rotable cap. 4,093,008, Cl. 145-61.0EA.
Martin, Tellis Alexander, to Mead Johnson & Company. Mercaptoacylamidobenzoyl glycine and mucolytic process. 4,093,739, Cl. 424-316.000.
Martino, Joseph F.: *See—*
King, Gerard J.; and Martino, Joseph F., 4,093,957, Cl. 357-24.000.
Martuscelli, Ezio: *See—*
Ferruti, Paolo; Martuscelli, Ezio; Riva, Fernando; and Provenzale, Luciano, 4,093,677, Cl. 260-858.000.
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Marxer S.p.A.: *See—*
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Cagliero, Germano, 4,093,747, Cl. 426-2.000.
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Masoero, Marcella: *See—*
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Masog, Charles Raymond; Petrie, Jerome Urban; and Mishima, Yasutsugu, to International Business Machines Corporation. Fast and normal rate instruction fetching. 4,093,983, Cl. 364-200.000.
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Commons, Thomas J.; Sheehan, John C.; and Lo, Young-Sek, 4,093,625, Cl. 260-306.70C.
Dash, Glen R., 4,093,221, Cl. 273-85.00G.
Levine, Jeffrey Steven, 4,093,927, Cl. 331-94.5PE.
Morgenthaler, Frederick R., 4,093,929, Cl. 333-31.00R.
Masuda, Taiji; and Mizuno, Hitoshi, to Kabushiki Kaisha Shikutani. Plunger sealing and lubricating apparatus for pumps. 4,093,240, Cl. 277-15.000.
Masurekar, Prakash S.; and Goodhue, Charles T., to Eastman Kodak Company. Method for producing cholesterol oxidase in the presence of a nonionic surfactant. 4,093,517, Cl. 195-66.00R.
Matskevich, Danil Danilovich; Ivashkova, Nina Efimovna; and Gavrikov, Viktor Vasilievich. Apparatus for testing the readiness of heat-treated coal for moulding. 4,092,843, Cl. 73-17.00R.
Matsunaga, Douglas S., to Braner Enterprises, Inc. Method of recoiling slit material. 4,093,140, Cl. 242-56.200.
Matsuoka, Kimiaki: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Mattson, Arne J., to Paul Anderson Industrier AB. Method of correcting the height level of a foundation. 4,092,832, Cl. 61-51.000.
Matzuk, Terrance. Ultrasonic scanning apparatus. 4,092,867, Cl. 73-609.000.
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Putzer, Raymond M.; and Maurino, William J., 4,093,175, Cl. 249-153.000.
Maus, Otfrid, to Carl Schenck AG, Firma. Arrangement for clamping vehicle wheels. 4,093,311, Cl. 301-9.0DH.
Maxwell, Bryce. Method and apparatus for measuring melt elasticity of polymers. 4,092,849, Cl. 73-101.000.
Mayama, Osamu: *See—*
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Mayer, Edward A.; and Sassi, Frank V., to Texaco Inc. Inlet gas mixer for internal combustion engine. 4,092,959, Cl. 123-119.00A.
Mayer, Gyorgy; Gyori, Janos; Rikker, Mihaly; Banfai, Antal; and Eszenyl, Ervin, to Licencia Talalmanyokat Ertekesito Vallalat. Process for producing reinforced concrete building units, especially floor panels having smooth surfaces and coffer-like inner holes, and formwork especially for carrying out the process. 4,093,689, Cl. 264-71.000.
Mayer, Hans-Gunther: *See—*
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Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Novel phenolic antioxidants, their preparation and their use. 4,093,592, Cl. 260-45.85B.
Maynor, Morris, Jr. Electric umbrella. 4,093,969, Cl. 361-232.000.
McAdams, Luther J., Sr. Locking mechanism for automobile fender skirt. 4,093,256, Cl. 280-153.00R.
McAllister, John P.; Schroeder, Franklin Theodore; and Stimson, Charles Terrance, to Burroughs Corporation. Data communications preprocessor. 4,093,981, Cl. 364-200.000.
McAuliffe, Gerald N., to Outboard Marine Corporation. Speed control for rotatable element driven by direct current motors. 4,093,896, Cl. 318-45.000.
McClure, L. C. Safety attachment for the horsehead of an oil well pumping unit. 4,092,872, Cl. 74-41.000.
McConnell, George B.: *See—*
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McEvoy Oilfield Equipment Company: *See—*
Bonds, James Vaull, 4,093,030, Cl. 166-315.000.
McGowan, Eric, to United Gas Industries Limited. Valves. 4,092,994, Cl. 137-65.000.
McGrail, Patrick Terence; Smith, Stephen Richard; Bannister, Frederick Robert; and Boutle, David Leonard, to Imperial Chemical Industries Limited. Polyurethane-polyanhydride subbing layer for photo sensitive elements. 4,093,458, Cl. 96-87.00R.
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McLennan, Ronald A. Vehicle restraining belt structure. 4,093,307, Cl. 297-385.000.
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McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 4,093,811, Cl. 548-342.000.
McWhirter, Garland G., deceased (by McWhirter, Nell J., surviving spouse), to McWhirter, Jerry. Method and apparatus for electronically relaxing poultry. 4,092,761, Cl. 17-1.00E.
McWhirter, Jerry: *See—*
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Memorex Corporation: *See*—
Withop, Arthur; and Travagli, Roger Emil, 4,093,688, Cl. 264-65.000.

Mengo, Alfred, Sr. Fishing-rod holder. 4,093,171, Cl. 248-515.000.

Mentovay, Leonard W.; and Palmer, Alex. High sensitivity electronic integrating torque rheometer. 4,093,902, Cl. 318-490.000.

Menzler, Peter-Michael: *See*—
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Merck & Co., Inc.: *See*—
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Merkel, Wulf: *See*—
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Merkl, George G. Method of removing gaseous pollutants from gas streams utilizing an activated form of aluminum. 4,093,702, Cl. 423-235.000.

Merkl, George G. Process for preparing peroxide group containing aluminum complex. 4,093,707, Cl. 423-626.000.

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Metacon AG: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
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Rohrs, Marvin K., 4,092,991, Cl. 134-127.000.

Metzger, Carl; Jager, Gerhard; and Lurssen, Klaus, to Bayer Aktiengesellschaft. N-Arylcarbamic acid esters and plant growth regulant compositions and methods. 4,093,447, Cl. 71-111.000.

Metzger, Karl Georg: *See*—
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,093,722, Cl. 424-246.000.

Meyer, Engelbert A., to USM Corporation. Retainer clips. 4,092,766, Cl. 24-73.0MF.

Meyer, Ernst; Trube, Hans; and Grimm, Hermann, to Daimler-Benz Aktiengesellschaft. Outlet nozzle for heating and venting systems of automobiles. 4,092,907, Cl. 98-40.00A.

Michaels, Alan S.: *See*—
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,093,708, Cl. 424-15.000.

Midcon Pipeline Equipment Co.: *See*—
Clavin, Edward A., 4,092,928, Cl. 104-119.000.

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Midland-Ross Corporation: *See*—
Case, Thomas L., 4,093,816, Cl. 13-2.00R.

Midorikawa, Yoshio, to Glasrock Products, Inc. Capillary body and method of producing the same. 4,093,769, Cl. 428-295.000.

Midrex Corporation: *See*—
Pietsch, Wolfgang B., 4,093,455, Cl. 75-256.000.

Miele, Raymond D., Jr.; and Watson, Roy E., to Eltra Corporation. Pressure gauge case. 4,092,866, Cl. 73-431.000.

Milberger, Ernest C.: *See*—
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,093,635, Cl. 260-346.750.

Miles, David Roy, to Imperial Chemical Industries Inc. Injection of additives into liquid streams. 4,093,407, Cl. 418-15.000.

Miller, Allan G.: *See*—
Hildebrandt, William V.; and Miller, Allan G., 4,093,088, Cl. 214-451.000.

Miller, Charles P., to Miller Formless Co., Inc. Ditch paving tool. 4,093,410, Cl. 425-59.000.

Miller, David D., to Gulf & Western Industries, Inc. Programming module for programmable controller using a microprocessor. 4,093,998, Cl. 364-900.000.

Miller, Denver W. Wind driven power mechanism. 4,093,398, Cl. 416-8.000.

Miller, Donald E., to General Electric Company. Digital logic circuits for comparing ordered character strings of variable length. 4,094,001, Cl. 364-900.000.

Miller, Donald F.: *See*—
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Miller, Douglas P., to Applied Power Inc. Fluid operated hydraulic pump including noise reduction means. 4,093,406, Cl. 417-401.000.

Miller Formless Co., Inc.: *See*—
Miller, Charles P., 4,093,410, Cl. 425-59.000.

Miller, George A.; and Fleischfresser, Marvin H., to Rohm and Haas Company. Amidine rice herbicides. 4,093,655, Cl. 260-564.0RF.

Miller, Hermann; and Keltjens, Heinz, to Mannesmann Aktiengesellschaft. Apparatus for loading and unloading ships. 4,093,003, Cl. 137-615.000.

Miller, John J., Jr.; Eppink, Donald L.; and Loxley, Ted A., to Sherwood Refractories, Inc. Cores for investment casting process. 4,093,017, Cl. 164-28.000.

Miller, Keith G. Dual path photographic camera for use in motor vehicles. 4,093,364, Cl. 352-132.000.

Miller, Robert C.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,093,558, Cl. 252-432.000.

Miller, William R.; and Pryde, Everett H., to United States of America, Agriculture. Alkyl 9,9(10,10)-bis(acyloxymethyl)octadecanoates as primary plasticizers for polyvinylchloride. 4,093,637, Cl. 260-405.000.

Miller, William Wanet, III. Head actuated control apparatus for battery-powered wheelchair. 4,093,037, Cl. 180-77.00R.

Milliken, J. Richard: *See*—
Capps, Overton B.; and Milliken, J. Richard, 4,093,299, Cl. 295-14.000.

Millonzi, Lawrence A.: *See*—
Morters, Ronald W.; and Millonzi, Lawrence A., 4,093,898, Cl. 318-227.000.

Mills, George J., to Northrop Corporation. High reflectivity laser mirrors. 4,093,349, Cl. 350-288.000.

Minami, Shunji, to Matsushita Electric Industrial Co., Ltd. Temperature-compensated analog voltage memory device. 4,094,007, Cl. 365-45.000.

Mindell, Marvin I., to Singer Company, The. Filmstrip cartridge. 4,093,142, Cl. 242-71.100.

Minnesota Mining and Manufacturing: *See*—
Taylor, Allen L., 4,092,862, Cl. 73-362.0CP.

Minnesota Mining and Manufacturing Company: *See*—
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Wickenberg, Ralph F.; Miller, Donald F.; and Anderson, Lyle R., 4,093,334, Cl. 339-107.000.

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Minolta Camera Kabushiki Kaisha: *See*—
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Mintzer, Alfred I.: *See*—
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Mishima, Yasutsugu: *See*—
Masog, Charles Raymond; Petrie, Jerome Urban; and Mishima, Yasutsugu, 4,093,983, Cl. 364-200.000.

Mitchell, Charles Ronald; and Sedam, Jason K., to Coca-Cola Company, The. Acoustical conveyor cover. 4,093,066, Cl. 198-861.000.

Mitchell, Neville Herbert, to Transputer (Proprietary) Limited. Accessory for a vehicle for monitoring its operation and that of its drive means. 4,093,939, Cl. 340-52.00F.

Mitsubishi Chemical Industries Limited: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.
Tanabe, Yasuo; Toriya, Jun; Sato, Masato; and Shiraga, Ken, 4,093,633, Cl. 260-346.110.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Mitsuhashi, Kenhachi: *See*—
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Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Production of porous polymers. 4,093,570, Cl. 260-2.50B.

Miyauchi, Hirotsugu: *See*—
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; and Yokoyama, Shigeo, 4,093,568, Cl. 260-2.20R.

Miyoshi, Mituji: *See*—
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Mizuno, Akira, to Goshi Kaisha Mizuno Kogeisha. Clutch and accelerator controlled brake lock for vehicles. 4,093,050, Cl. 192-0.049.

Mizuno, Hitoshi: *See*—
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Mobil Oil Corporation: *See*—
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Gross, Benjamin; and Lee, Wooyoung, 4,093,537, Cl. 208-164.000.
Kerr, George T.; and Chester, Arthur W., 4,093,560, Cl. 252-455.00Z.

Rodewald, Paul G.; and Haag, Werner O., 4,093,543, Cl. 210-59.000.
Schwartz, Albert B., 4,093,535, Cl. 208-120.000.
Weisz, Paul Burg; and Zahner, John Clarence, 4,093,029, Cl. 166-305.00R.

Mohrman, Richard C.; and Seidenberg, Richard L., to Bausch & Lomb Incorporated. Ophthalmic instrument optical system. 4,093,360, Cl. 351-13.000.

Molchan, Andrew John, to Bell Telephone Laboratories, Incorporated. Contaminant resistant female connector. 4,093,331, Cl. 339-39.000.

Moldram, Peter Andrew: *See—*
Gladstone, David John; and Moldram, Peter Andrew, 4,093,825, Cl. 179-15.0BS.

Molin, Neil Leroy, to Danfoss A/S. Spring brake assembly. 4,093,038, Cl. 180-82.00R.

Molins, Desmond Walter, to Molins Limited. Ejection devices. 4,093,075, Cl. 209-73.000.

Molins, Desmond Walter, to Molins Limited. Apparatus for assembling rod-like articles. 4,093,496, Cl. 156-449.000.

Molins Limited: *See—*
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Molins, Desmond Walter, 4,093,496, Cl. 156-449.000.

Molins Machine Company, Inc.: *See—*
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Moliterno, Louis J.; and Jennings, Reuel E., to Ajax Magnethermic Corporation. Apparatus and method for inductively heating metallic tubing having an upset portion. 4,093,839, Cl. 219-8.500.

Moll, William F., Jr.; and Botta, Frank J., to Yara Engineering Corporation. Electroconductive coatings. 4,093,564, Cl. 252-518.000.

Mollenauer, Linn Frederick: *See—*
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Monarch Marking Systems, Inc.: *See—*
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Monsanto Company: *See—*
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Monsanto Research Corporation: *See—*
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Montedison S.p.A.: *See—*
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Mookherjee, Braja Dulal: *See—*
Withycombe, Donald Arthur; Mookherjee, Braja Dulal; Vock, Manfred Hugo; and Vinals, Joaquin Francisco, 4,093,752, Cl. 426-536.000.

Moon, Firma: *See—*
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Moon, Jack L.: *See—*
Eberline, Howard C.; and Moon, Jack L., 4,093,936, Cl. 340-18.0CM.

Moone, Ronald. Hole forming machine. 4,092,892, Cl. 83-413.000.

Mooradian, Arman: *See—*
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Moore, Anthony John: *See—*
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Moore, James Walter; and Braun, Stephen Alphonse, to Deere & Company. Air intake silencer. 4,093,039, Cl. 181-229.000.

Moore, Robert P.: *See—*
Ewy, Robert J.; and Moore, Robert P., 4,093,836, Cl. 200-61.530.

Morane, Bruno; Hardouin, Yves; and Gueret, Jean-Louis, to L'Oreal. Atomizer with air inlet valve. 4,093,124, Cl. 239-327.000.

Moren, Robert D. Safety device for guns. 4,092,794, Cl. 42-1.0LP.

Morgenthaler, Frederick R., to Massachusetts Institute of Technology. Method of synthesizing cylindrically symmetric static magnetic fields in a locally saturated magnet and apparatus providing said fields. 4,093,929, Cl. 333-31.00R.

Mori, Toshito: *See—*
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Morikawa, Tuneo: *See—*
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Moring, Rodger L., to Caterpillar Tractor Co. Method for making a universal joint. 4,092,772, Cl. 29-434.000.

Morishita, Yasomatsu, to Ryobi, Ltd. Fishing reel brake. 4,093,144, Cl. 242-84.52A.

Morozko, Ekaterina Alexandrovna: *See—*
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.

Morris, Donald A.; Wilson, Eddie A.; and Little, Eric A., to Packer Plastics, Inc. Flower pot and interlocking saucer. 4,092,804, Cl. 47-66.000.

Morris, Earl L.; and Fields, Larry D., to Acorn Engineering Company. Dashpot mechanism for self-closing plumbing valves. 4,093,177, Cl. 251-54.000.

Morris, Hugh C.: *See—*
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Morrison, Howard J.: *See—*
Isaacson, Anson; Morrison, Howard J.; Baer, Ralph H.; Fletchic, Donald K.; and Keller, Albert G., 4,093,832, Cl. 179-100.40D.

Morse, Henry Clifton. Mailer. 4,093,117, Cl. 229-70.000.

Morters, Ronald W.; and Millonzi, Lawrence A., to Harnischfeger Corporation. Control system for regulating the speed of an electric motor. 4,093,898, Cl. 318-227.000.

Morton-Norwich Products, Inc.: *See—*
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Wright, George C.; and Goldenberg, Marvin M., 4,093,799, Cl. 542-422.000.

Mosehauer, Michael: *See—*
Fletcher, George Leland; and Mosehauer, Michael, 4,093,463, Cl. 96-67.000.

Moskowitz, Myron Alan. Horse racing game. 4,093,238, Cl. 273-277.000.

Mosser Industries, Inc.: *See—*
Connor, Peter J., 4,093,245, Cl. 277-237.00R.

Motorola, Inc.: *See—*
Gurtler, Richard Warren; Handy, Robert Maxwell; Keeling, Michael Chancey; and Lesk, Israel Arnold, 4,092,977, Cl. 126-270.000.
Riccio, Joseph F., Jr., 4,093,958, Cl. 357-68.000.

Mowe, Wayne T.: *See—*
Bromley, James E.; McNamara, Michael M.; and Mowe, Wayne T., 4,093,147, Cl. 242-159.000.

Mraz, George J.: *See—*
Ford, Hugh; Mraz, George J.; and Simier, Jean Noel, 4,093,100, Cl. 220-3.000.

M'Sadoques, Andre J.; and Sabatella, Robert J., to General Electric Company. Main lug assembly for circuit breaker load centers. 4,093,970, Cl. 361-361.000.

Mueller, Robert S.: *See—*
Castillo, Herman B.; and Mueller, Robert S., 4,093,681, Cl. 261-122.000.

Mueller, Siegfried: *See—*
Buechner, Oskar; Geierhzas, Herbert; Gierth, Volker; Mueller, Siegfried; and Zacher, Wieland, 4,093,703, Cl. 423-245.000.

Muller, Francois, to Produits Chimiques Pechiney-Saint-Gobain. Simultaneous preparation of organic acid chlorides and trichloroacryloyl chloride and product. 4,093,638, Cl. 260-408.000.

Mullins, Rex, to Coal Industry (Patents) Ltd. Method of and apparatus for controlling advance of underground armored conveyors. 4,093,309, Cl. 299-1.000.

Mullins, Wayne L. Combination die and pallet. 4,093,174, Cl. 249-120.000.

Mumford, George V., to Owens-Illinois, Inc. Tablet container. 4,093,103, Cl. 220-283.000.

Muncheryan, Hrand M. Silent awakening system with means adapted to induce sleep. 4,093,944, Cl. 340-279.000.

Muntjanoff, John Richard; and Lamport, Ivan Richard, to Caterpillar Tractor Co. Push-pull cable and rod assembly with seal. 4,093,241, Cl. 277-24.000.

Muntschick, Peter, to VEB Kombinat Zentronik. Typewriter ribbon feed device. 4,093,060, Cl. 400-236.100.

Murakami, Saburo, to Shimokawa, Wataru. Converting continuous rotary motion. 4,092,873, Cl. 74-82.000.

Murogov, Viktor Mikhailovich: *See—*
Iljunin, Vladimir Grigorievich; Kuznetsov, Igor Alexeevich; Murogov, Viktor Mikhailovich; and Shmelev, Anatoly Nikolaevich, 4,093,514, Cl. 176-65.000.

Murphy, John R.: *See—*
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T.; and Murphy, John R., 4,093,573, Cl. 260-2.5BE.

Murray, John A., to U.S. Terrazzo Panels, Inc. Method for the manufacture of concrete and like products. 4,093,690, Cl. 264-82.000.

Murtha, Timothy P.; Jones, William A.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation using multi-metallic zeolite catalyst. 4,093,671, Cl. 260-668.00R.

Muschaweck, Roman: *See—*
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, 4,093,735, Cl. 424-274.000.

Mushy, Roman Yakovlevich: *See—*
Bratslavskaya, Alla Lvovna; Makarova, Serafima Borisovna; Mushy, Roman Yakovlevich; Myasoedova, Galina Vladimirovna; Savvin, Sergei Borisovich; and Seraya, Vera Ivanovna, 4,093,792, Cl. 526-200.000.

Myasoedova, Galina Vladimirovna: *See—*
Bratslavskaya, Alla Lvovna; Makarova, Serafima Borisovna; Mushy, Roman Yakovlevich; Myasoedova, Galina Vladimirovna; Savvin, Sergei Borisovich; and Seraya, Vera Ivanovna, 4,093,792, Cl. 526-200.000.

Myers, Richard L.: *See—*
Fite, Wade L.; and Myers, Richard L., 4,093,855, Cl. 250-282.000.

N. Lundbergs Fabriks AB: *See—*
Strom, Torsten Erik Theodor, 4,093,121, Cl. 239-117.000.

N. T. Gates Company: *See—*
Russell, Walter W.; and Stoetzer, Richard P., 4,093,105, Cl. 220-373.000.

N. V. Technische Maatschappij Marchand-Andriessen: *See—*
van Staveren, Dirk Adriaan, 4,093,501, Cl. 156-580.000.

Nafissi-Varchei, Mohammed Mehdi, to Schering Corporation. Methyl-6-n-propoxybenzothiazole-2-carbamate and anthelmintic pharmaceutical compositions thereof. 4,093,731, Cl. 424-270.000.

Nagao, Masao, to Asahi Kasei Kogyo Kabushiki Kaisha. System for recording and reproducing hologram. 4,094,011, Cl. 365-216.000.

Naito, Michihisa: *See*—
Otsuki, Akira; Naito, Michihisa; Mashimo, Yukifumi; and Ikeda, Akira, 4,093,759, Cl. 428-35.000.

Naito, Norinao: *See*—
Ogata, Mitsutoshi; and Naito, Norinao, 4,093,482, Cl. 156-210.000.

Naka, Hiromitsu. Apparatus for producing flexible non-skid strip. 4,093,499, Cl. 156-498.000.

Nakajima, Takeshi: *See*—
Komai, Takeshi; Matsushima, Masaru; and Nakajima, Takeshi, 4,093,786, Cl. 526-57.000.

Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shiraishi, Takeichi; Matsuura, Kazuo; and Miyoshi, Mituji, 4,093,789, Cl. 526-114.000.

Nakamura, Tsutomu: *See*—
Fujita, Masahiko; Gotoh, Toshihiko; and Nakamura, Tsutomu, 4,093,897, Cl. 218-138.000.

Nakano, Yuji: *See*—
Hirabayashi, Masaya; Omi, Naoki; Nakano, Yuji; and Oshiba, Tetsuro, 4,093,502, Cl. 156-624.000.

Nalco Chemical Company: *See*—
Reven, Frederick V.; and Connors, Charles W., 4,093,778, Cl. 428-411.000.

Narayan, Surendra D., to Allied Chemical Corporation. Laminated buckle with no false latch. 4,092,767, Cl. 24-230.0AL.

Nash, Lawrence H., to Kalo Laboratories, Inc. Bis halogenated phenoxyalkanoates and the method of making same. 4,093,664, Cl. 260-610.00D.

National Can Corporation: *See*—
Kraska, John L., 4,093,102, Cl. 220-67.000.

National Force Company: *See*—
Ford, Hugh; Mraz, George J.; and Simier, Jean Noel, 4,093,100, Cl. 220-3.000.

National Research Development Corporation: *See*—
Pearson, Leonard Charles, 4,093,290, Cl. 293-15.000.

National Semiconductor Corporation: *See*—
Hernandez, Gilbert Villanueva, 4,092,879, Cl. 81-6.000.
Nickl, Franklyn George, 4,093,865, Cl. 250-566.000.

National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,093,798, Cl. 536-48.000.

National Steel Corporation: *See*—
Loest, Kent W.; and Kesler, George H., 4,093,700, Cl. 423-120.000.
Manzonelli, Carmen C.; and Tessandori, Joseph L., 4,093,475, Cl. 148-32.000.

Navin, Robert F.: *See*—
Cordts, Howard P.; Navin, Robert F.; and Ross, R. Charles, 4,093,768, Cl. 428-287.000.

Naylor, Thomas H. Self-watering apparatus for plants. 4,092,803, Cl. 47-62.000.

NCR Corporation: *See*—
Lockwood, George C.; and Aneshansley, Nicholas E., 4,094,008, Cl. 365-149.000.
Paschal, James P.; Nickel, Donald F.; and Drozd, Charles J., 4,093,878, Cl. 307-291.000.

Neese, Susan Lynne Nirmaier. Educational device. 4,092,786, Cl. 35-8.00R.

Nelson, Eldrid W., to Chas. Olson & Sons and Wheel Service Co., Inc. Wheelchair retaining apparatus for vehicles. 4,093,303, Cl. 296-65.00R.

Nelson, George D., to Monsanto Company. Production of cyanuric acid from urea. 4,093,808, Cl. 544-192.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-5-oxa-PGE_1 compounds. 4,093,659, Cl. 260-586.00R.

Neogi, Amar N.: *See*—
Erickson, Charles E.; and Neogi, Amar N., 4,093,361, Cl. 351-160.000.

Neumann, Eckart: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.

Neumann, Joachim, to Volkswagenwerk Aktiengesellschaft. Catalytic device for the catalytic purification of exhaust gases. 4,093,423, Cl. 23-288.0FC.

Neustadt, Bernard R., to Schering Corporation. Anti-hypertensive polyhaloisopropyl-substituted arylureas. 4,093,742, Cl. 424-322.000.

New Archery Products Corp.: *See*—
Simo, Miroslav Andrew, 4,093,230, Cl. 273-106.50B.

Newark Brush Company: *See*—
Horton, John P.; and LeWand, Susan H., 4,092,758, Cl. 15-180.000.

Newell, E. Strohm. Drive mechanism for a line-pulling apparatus. 4,093,185, Cl. 254-154.000.

Newton, Brian R., to Newton & Taylor (Proprietary) Limited. Bottle racks, particularly racks for wine bottles. 4,093,076, Cl. 211-74.000.

Newton & Taylor (Proprietary) Limited: *See*—
Newton, Brian R., 4,093,076, Cl. 211-74.000.

Nguyen, Van-Tran: *See*—
Damen, Theodoor Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,093,344, Cl. 350-147.000.

Nickel, Donald F.: *See*—
Paschal, James P.; Nickel, Donald F.; and Drozd, Charles J., 4,093,878, Cl. 307-291.000.

Nickl, Franklyn George, to National Semiconductor Corporation. Code symbol scanner using a double X bar pattern. 4,093,865, Cl. 250-566.000.

Nicol, Ronald, to Heinemann Electric Company. Circuit breaker housing, grip means and bus terminal. 4,093,838, Cl. 200-303.000.

Niedzinski, Edmund John: *See*—
Oser, Nathan; and Niedzinski, Edmund John, 4,092,842, Cl. 72-379.000.

Nielsen, Robert A.: *See*—
McInnis, Andrew M.; and Nielsen, Robert A., 4,092,921, Cl. 101-93.210.

Niemann, Klaus: *See*—
Wulf, Helmut; and Niemann, Klaus, 4,092,931, Cl. 104-247.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See*—
Isono, Tadao, 4,093,365, Cl. 352-140.000.

Nihon Hammond Kabushiki Kaisha: *See*—
Yamashita, Shigeru; Masaki, Kazuo; and Shibahara, Masashi, 4,093,820, Cl. 179-1.00J.

Nihon Nohyaku Co., Ltd.: *See*—
Yabutani, Kunihiro; Ikeda, Kenichi; Hatta, Shigenori; and Harada, Tatsuo, 4,093,743, Cl. 424-324.000.

Nihon Yushi Co., Ltd.: *See*—
Komai, Takeshi; Matsushima, Masaru; and Nakajima, Takeshi, 4,093,786, Cl. 526-57.000.

Nii, Katutosi: *See*—
Kaneko, Ryoichi; Nii, Katutosi; Hiroyama, Hiroo; and Okano, Kinpei, 4,093,320, Cl. 308-9.000.

NIMCO Corporation: *See*—
Bachner, George L.; and Bachner, Jerry G., 4,093,115, Cl. 229-17.00G.

Nippon Electric Co., Ltd.: *See*—
Ishiguro, Tatsuo; and Suzuki, Norio, 4,093,962, Cl. 358-138.000.
Watanabe, Hiroshi, 4,093,919, Cl. 325-316.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,093,925, Cl. 330-277.000.

Nippon Oil Company, Limited: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shiraishi, Takeichi; Matsuura, Kazuo; and Miyoshi, Mituji, 4,093,789, Cl. 526-114.000.

Nippon Paint Co., Ltd.: *See*—
Tsutsui, Koichi; and Eguchie, Yoshio, 4,093,674, Cl. 260-830.00P.

Nippon Piston Ring Co., Ltd.: *See*—
Sugahara, Eisuke, 4,093,239, Cl. 277-3.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Saito, Kyuta; and Ishino, Fukuya, 4,093,819, Cl. 178-2.00R.

Nippondenso Co., Ltd.: *See*—
Ichihara, Hiroo; and Ohta, Yuzuru, 4,093,437, Cl. 55-487.000.

Nishikawa, Masaji, to Olympus Optical Company Limited. Electrographic apparatus. 4,093,368, Cl. 355-3.0SC.

Nishikawa, Tomoyasu: *See*—
Kato, Hideo; Nishikawa, Tomoyasu; and Koshinaka, Eiichi, 4,093,630, Cl. 260-326.850.

Nishikawa, Yasuo; Watanabe, Akira; Sugimoto, Tetsuya; Yabuki, Kazuyasu; and Hatayama, Yoshio, to Kyushu Refractories Co., Ltd. Catalyst for the reduction of nitrogen oxides and method for the production thereof. 4,093,561, Cl. 252-466.00J.

Nishino, Hisashi; Hosokawa, Teruo; and Hioki, Ikuo, to Minolta Camera Kabushiki Kaisha. Optical low pass filter. 4,093,346, Cl. 350-162.0SF.

Nissan Motor Company Limited: *See*—
Kishida, Katsuhiro; and Oyamada, Akira, 4,093,243, Cl. 277-96.200.
Ogata, Mitsutoshi; and Naito, Norinao, 4,093,482, Cl. 156-210.000.
Takemura, Tooji; Saitoh, Shigeru; and Hamada, Mitsuharu, 4,092,930, Cl. 104-247.000.

Nittetu Chemical Engineering Ltd.: *See*—
Tsuruta, Hidemasa; Itoh, Shoji; Otsuka, Masayuki; and Shimizu, Nsoki, 4,093,505, Cl. 159-9.00A.

Nixdorf Computer AG: *See*—
Pollmeier, Werner, 4,093,877, Cl. 307-270.000.

Noboru, Murata, to Oki Electric Industry Co., Ltd. Color gradient analyzer. 4,093,385, Cl. 356-188.000.

Nohira, Hidetaka; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system in an internal combustion engine. 4,092,960, Cl. 123-119.00A.

Nolan, John L.; Nordby, Harvey M.; and Jensen, Marvin E., to Hollister Incorporated. Assembly for preparing inserts for hospital identification bracelets. 4,093,277, Cl. 282-24.00R.

Noll, Klaus Reinhold: *See*—
Kruger, Gerd; Keck, Johannes; Noll, Klaus Reinhold; Pieper, Helmut; Ziegler, Harald; Ballhause, Helmut; and Kahling, Joachim, 4,093,734, Cl. 424-274.000.

Noranda Mines Limited: *See*—
LeRoy, Rodney Lash, 4,093,780, Cl. 428-458.000.

Nordby, Harvey M.: *See*—
Nolan, John L.; Nordby, Harvey M.; and Jensen, Marvin E., 4,093,277, Cl. 282-24.00R.

Nordrehaug, John: *See*—
Shroff, Bansi K.; Dekker, Frank; and Nordrehaug, John, 4,093,149, Cl. 242-198.000.

Norland Corporation: *See*—
Smith, Steven R.; and Rose, Frederick A., 4,093,995, Cl. 364-900.000.

Norman, Oscar L.: *See*—
Wynkoop, Raymond; Norman, Oscar L.; and Norton, Richard V., 4,093,528, Cl. 204-180.00P.

North American Systems, Inc.: *See*—
Reiber, Edwin E., 4,093,297, Cl. 294-99.00R.

North Electric Company: *See*—
Das, Santanu, 4,093,985, Cl. 364-200.000.

Northrop Corporation: *See*—
Mills, George J., 4,093,349, Cl. 350-288.000.
Norton, Richard V.: *See*—
Wynkoop, Raymond; Norman, Oscar L.; and Norton, Richard V., 4,093,528, Cl. 204-180.00P.
Novinson, Thomas: *See*—
Robins, Roland K.; O'Brien, Darrell E.; and Novinson, Thomas, 4,093,617, Cl. 544-281.000.
Novotny, John: *See*—
Westdale, Virgil W.; and Novotny, John, 4,093,459, Cl. 96-1.0SD.
Nowisch, Heinz K., to Black Clawson Company, The. Method and apparatus for slitting a continuous web of material. 4,092,886, Cl. 83-56.000.
Noxell Corporation: *See*—
Blackburne, Owen Rodney; and Shapiro, Warren B., 4,093,711, Cl. 424-54.000.
NTN Toyo Bearing Co. Ltd.: *See*—
Tsukumo, Zenzaburo, 4,093,390, Cl. 403-373.000.
Nussbaumer, Henri J., to International Business Machines Corporation. Fast discrete transform generator and digital filter using same. 4,093,994, Cl. 364-726.000.
NUSTEP Trenndusen Entwicklungsund Patentverwertungsgesellschaft mbH & Co. Kommanditgesellschaft: *See*—
Wenzel, Werner, 4,093,436, Cl. 55-269.000.
Nutting, David J.; and Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. Player operated game apparatus. 4,093,232, Cl. 273-121.00A.
Nutz, Karl-Diether, to Licentia Patent-Verwaltungs-G.m.b.H. Reference source for producing a current which is independent of temperature. 4,093,907, Cl. 323-1.000.
Obermayer, Bertram: *See*—
List, Hans; Skatsche, Othmar; Greier, Josef; Obermayer, Bertram; Feichtinger, Gerhard; and Wagner, Johann, 4,092,956, Cl. 123-41.740.
O'Brien, Darrell E.: *See*—
Robins, Roland K.; O'Brien, Darrell E.; and Novinson, Thomas, 4,093,617, Cl. 544-281.000.
Occidental Oil Shale, Inc.: *See*—
Ridley, Richard D., 4,093,026, Cl. 166-256.000.
Ochylski, Edward. Hog head removal method. 4,092,762, Cl. 17-45.000.
O'Clair, Chester R.: *See*—
Greskovich, Charles D.; and O'Clair, Chester R., 4,093,687, Cl. 264-65.000.
Oda, Takeshi; Mori, Toshito; and Yamaguchi, Takashi, to Kowa Company Ltd. Novel aminocyclitols and process for production thereof. 4,093,797, Cl. 536-17.000.
O'Dell, William Raymond: *See*—
Kelman, Arnold Lloyd; and O'Dell, William Raymond, 4,093,860, Cl. 250-445.00T.
Oertle, Donald H.; Vennett, Richard M.; Casad, Burton M.; and Radd, Fred J., to Continental Oil Company. Hydrogen probe with limited active area. 4,092,844, Cl. 73-23.000.
Ogata, Mitsutoshi; and Naito, Norinao, to Nissan Motor Company Limited; and Fukuoka Paper Company, Limited. Heat and sound insulator of curved corrugated paperboard and method of shaping same. 4,093,482, Cl. 156-210.000.
Ohio State University Research Foundation, The: *See*—
Gilson, Richard D., 4,093,159, Cl. 244-187.000.
Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.
Ohta, Yuzuru: *See*—
Ichihara, Hiroo; and Ohta, Yuzuru, 4,093,437, Cl. 55-487.000.
Ohtsuka, Yozo: *See*—
Kojima, Takakazu; and Ohtsuka, Yozo, 4,093,810, Cl. 548-321.000.
Oil Refining Systems of Florida, Inc.: *See*—
Sterkenburg, Jon L. D.; and Kelbert, George O., 4,093,548, Cl. 210-180.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,093,712, Cl. 424-177.000.
Okano, Kinpei: *See*—
Kaneko, Ryoichi; Nii, Katutosi; Hiroyama, Hiroo; and Okano, Kinpei, 4,093,320, Cl. 308-9.000.
Oki Electric Industry Co., Ltd.: *See*—
Noboru, Murata, 4,093,385, Cl. 356-188.000.
Olander, Walter Karl, to General Electric Company. Method for polymerization of polyphenylene oxides. 4,093,596, Cl. 260-47.0ET.
Olander, Walter Karl, to General Electric Company. Polymerization of 2,6-di-substituted phenols. 4,093,597, Cl. 260-47.0ET.
Olander, Walter Karl: *See*—
Banucci, Eugene George; and Olander, Walter Karl, 4,093,598, Cl. 260-47.0ET.
Oldham, Edwin W.: *See*—
Barnes, J. Haywood, 4,093,128, Cl. 241-82.500.
Oldham, Vern L.: *See*—
Barnes, J. Haywood, 4,093,128, Cl. 241-82.500.
Olin Corporation: *See*—
Johnson, Peter Walton, 4,093,110, Cl. 227-9.000.
Middleton, Verne L., 4,093,024, Cl. 165-170.000.
Olivares, Ismael Adolfo: *See*—
Altland, Henry Wolf; Cowan, Stanley Wray; and Olivares, Ismael Adolfo, 4,093,462, Cl. 96-66.0HD.
Olive, Graham; Lake, Royston Ernest Walter; and Dionne, Joseph Guy Gilles, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laser addressed display. 4,093,852, Cl. 250-213.00A.
Oliver, Robert John, to Zimm-Zamm Aktiengesellschaft. Anchoring device for captive ball and cord for a game. 4,093,225, Cl. 273-95.0AA.
Olschewski, Armin: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,093,053, Cl. 192-98.000.
Olympus Optical Company Limited: *See*—
Furuta, Kenji, 4,093,882, Cl. 310-268.000.
Nishikawa, Masaji, 4,093,368, Cl. 355-3.0SC.
Tsuda, Hiroshi, 4,093,377, Cl. 355-76.000.
O'Malley, Martin Bernard, to Johns-Manville Corporation. Skid pipe insulation for steel mill reheating furnaces. 4,093,760, Cl. 428-36.000.
Omi, Naoki: *See*—
Hirabayashi, Masaya; Omi, Naoki; Nakano, Yuji; and Oshiba, Tetsuro, 4,093,502, Cl. 156-624.000.
Onder, Kemal B.: *See*—
Chen, Augustin T.; and Onder, Kemal B., 4,093,604, Cl. 260-77.5CH.
O'Neal, Charles D., III, to Varian Associates, Inc. Vacuum measuring ionization apparatus control. 4,093,913, Cl. 324-33.000.
O'Neill, Daniel R.: *See*—
Urynowicz, James P.; O'Neill, Daniel R.; Jones, Hale M.; and Painter, Alan, 4,093,148, Cl. 242-182.000.
Ono, Junichi; Shimoura, Akira; and Tanaka, Yukiyasu, to Daihatsu Kogyo Kabushiki Kaisha. Gasoline engine fed with lean mixture only. 4,092,969, Cl. 123-191.00S.
Ono, Masahiko, to Tokyo Shibaura Electric Co., Ltd. Data processing system having a cycle control function. 4,093,984, Cl. 364-200.000.
Onoda Cement Co., Ltd.: *See*—
Itoh, Tsutomu, 4,093,296, Cl. 294-90.000.
Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Process for recovering a dialkylarylketone. 4,093,660, Cl. 260-591.000.
Oono, Hideshi: *See*—
Kume, Kazunari; Watanabe, Minoru; Oono, Hideshi; and Tamaru, Munetaka, 4,092,820, Cl. 58-23.00R.
Oquita, Ramiro. Balloon pinata. 4,092,798, Cl. 46-11.000.
Ornsteen, Robert L. Method for forming a hot melt adhesive cartridge. 4,093,485, Cl. 156-244.130.
Oropallo, Robert A., to American Brass & Aluminum Foundry Co., Inc. Drain structure. 4,092,745, Cl. 4-288.000.
Ortho Pharmaceutical Corporation: *See*—
Ziets, George A.; and Williams, Bernard L., 4,093,490, Cl. 156-245.000.
Osakeyhtio, A. Ahlstrom: *See*—
Henricson, Kaj Olof, 4,093,508, Cl. 162-30.00K.
Osdene, Thomas S.; and Sanders, Edward B., to Philip Morris Incorporated. Process for producing 2-cyano N-substituted heterocyclic compounds and products produced thereby. 4,093,620, Cl. 260-291.000.
Oser, Nathan; and Niedzinski, Edmund John, to Johns-Manville Corporation. Deeply embossed sheet product and method and apparatus for the production thereof. 4,092,842, Cl. 72-379.000.
Oshiba, Tetsuro: *See*—
Hirabayashi, Masaya; Omi, Naoki; Nakano, Yuji; and Oshiba, Tetsuro, 4,093,502, Cl. 156-624.000.
Ostertag, Alfred: *See*—
Jurgens, Rainer; and Ostertag, Alfred, 4,092,881, Cl. 81-57.340.
Otsuka, Masayuki: *See*—
Tsuruta, Hidemasa; Itoh, Shoji; Otsuka, Masayuki; and Shimizu, Naoki, 4,093,505, Cl. 159-9.00A.
Otsuki, Akira; Naito, Michihisa; Mashimo, Yukifumi; and Ikeda, Akira, to Toyo Ink Manufacturing Co., Ltd. Glass container coated with polyurethane. 4,093,759, Cl. 428-35.000.
Otto, Ferdinand P.: *See*—
Chibnik, Sheldon; and Otto, Ferdinand P., 4,093,614, Cl. 260-299.000.
Ouellette, Charles W., to Raytheon Company. Expandable transducer array. 4,093,935, Cl. 340-8.00S.
Outboard Marine Corporation: *See*—
McAuliffe, Gerald N., 4,093,896, Cl. 318-45.000.
Schrimpf, Carl F.; and Van Rens, Russel J., 4,093,403, Cl. 417-246.000.
Overmyer Mould Company of Pennsylvania: *See*—
Kindelan, James J., 4,092,883, Cl. 82-3.000.
Owen, Geoffrey Robert: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Owen, Geoffrey Robert, 4,093,729, Cl. 424-270.000.
Owens-Illinois, Inc.: *See*—
Go, Santos W., 4,093,593, Cl. 260-45.85P.
Mumford, George V., 4,093,103, Cl. 220-283.000.
Smalley, Ned J.; and Whitney, Ralph H., 4,093,094, Cl. 215-276.000.
Oyama, George Clement. Sprouter for home use with automatic irrigator. 4,092,802, Cl. 47-16.000.
Oyamada, Akira: *See*—
Kishida, Katsuhiro; and Oyamada, Akira, 4,093,243, Cl. 277-96.200.
Ozawa, Masahiro; Komatsu, Tadaaki; and Matsuoka, Kimiaki. Process of isomerizing oligomers of hexafluoropropene. 4,093,670, Cl. 260-653.10R.

Ozerov, Vladimir Mikhailovich: *See—*
Eliseev, Stanislav Borisovich; Butskoi, Jury Alexandrovich; Dmitrievsky, Vladimir Sergeevich; Golubeva, Albina Andreevna; Ozerov, Vladimir Mikhailovich; Volkov, Valentin Stepanovich; and Vasninova-Shipulina, Iya Petrovna, 4,093,448, Cl. 75-3.000.

P.C. Compteurs Limited: *See—*
Plumb, George Arthur; Bushell, John Leo Thomas; and Radford, Patrick Louis, 4,093,871, Cl. 307-106.000.

P. R. Mallory & Co. Inc.: *See—*
Voyles, Gerald A., 4,093,972, Cl. 361-433.000.

Paabo, Ulo; and Albertsen, Erik Horskjar, to IFO AB. Device for purifying sewer water in small sewer systems. 4,093,551, Cl. 210-201.000.

Pace, E. Alan: *See—*
Thomas, Arthur E.; and Pace, E. Alan, 4,092,764, Cl. 19-107.000.

Packard, James C.: *See—*
Hunley, Benjamin L.; and Packard, James C., 4,093,010, Cl. 150-52.00J.

Packer Plastics, Inc.: *See—*
Morris, Donald A.; Wilson, Eddie A.; and Little, Eric A., 4,092,804, Cl. 47-66.000.

Page, William R.; and Rees, James G. Modulating valve assembly for railroad car brake cylinders. 4,093,315, Cl. 303-59.000.

Painter, Alan: *See—*
Urynowicz, James P.; O'Neill, Daniel R.; Jones, Hale M.; and Painter, Alan, 4,093,148, Cl. 242-182.000.

Palmer, Alex: *See—*
Mentovay, Leonard W.; and Palmer, Alex, 4,093,902, Cl. 318-490.000.

Pannell, Ralph: *See—*
Travis, James; and Pannell, Ralph, 4,093,612, Cl. 260-122.000.

Pappas, Jeffrey, to Vortex Design Ltd. Key telephone system line circuit. 4,093,830, Cl. 179-99.000.

Paramount Health Equipment Corp.: *See—*
Coker, Charles Milton; and Kling, Gary Marvin, 4,093,213, Cl. 272-118.000.
Coker, Charles Milton; and Coker, Cliff James, 4,093,214, Cl. 272-118.000.

Park Rubber Company: *See—*
Canfield, David L., 4,093,120, Cl. 238-8.000.

Parke, David & Company: *See—*
Tinney, Francis John, 4,093,611, Cl. 260-112.5LH.

Parris, Robert L.: *See—*
Urick, Robert J.; and Parris, Robert L., 4,093,934, Cl. 340-2.000.

Parsons, Robert C. Method of making decorative panels. 4,093,754, Cl. 427-259.000.

Parts, Leo P.; and Hardy, Edgar E., to Monsanto Research Corporation. Solid solderable polyurethane data signal recording medium. 4,093,684, Cl. 264-25.000.

Paschal, James P.; Nickel, Donald F.; and Drozd, Charles J., to NCR Corporation. De-glitchablenon-metastable flip-flop circuit. 4,093,878, Cl. 307-291.000.

Pask, George, to Rolls-Royce Limited. Fuel injectors for gas turbine engines. 4,092,826, Cl. 60-39.74R.

Passavant Corporation: *See—*
Barnabe, Charles E., 4,092,935, Cl. 110-186.000.

Patchornik, Abraham: *See—*
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, 4,093,802, Cl. 544-27.000.
Haviv, Fortuna; and Patchornik, Abraham, 4,093,804, Cl. 544-27.000.

Patel, Chandra Kumar Naranbhai: *See—*
Damen, Theodoor Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,093,344, Cl. 350-147.000.

Patton, John T.: *See—*
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T.; and Murphy, John R., 4,093,573, Cl. 260-2.5BE.

Paul Anderson Industrier AB: *See—*
Mattson, Arne J., 4,092,832, Cl. 61-51.000.

Paulinski, Ronald Adam, to Burroughs Corporation. Means and methods for detecting the possibility of a failure occurring in the operation of a digital circuit. 4,093,851, Cl. 235-302.200.

Paweck AG: *See—*
Eckold, Gerd-Jurgen; and Maass, Hans, 4,092,840, Cl. 72-312.000.

Pawlak, Jan: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Payne, John R., to Kaiser Aluminum & Chemical Corporation. Bonding of refractory hard metal. 4,093,524, Cl. 204-61.000.

Peach, George Albert: *See—*
Harrison, Reginald William; and Peach, George Albert, 4,093,484, Cl. 156-244.130.

Peale, Jack: *See—*
Chu, Bing-Lun; Subbarao, Wunnava Venkata; Peale, Jack; McCune, Kent; and Steiner, Marvin Elroy, 4,093,971, Cl. 361-382.000.

Pearlstein, Fred: *See—*
MacNamara, Elizabeth L.; and Pearlstein, Fred, 4,093,566, Cl. 252-527.000.

Pearson, Leonard Charles, to National Research Development Corporation. Vehicle with safety device. 4,093,290, Cl. 293-15.000.

Pekema OY: *See—*
Honkanen, Arto; and Laiho, Erkki, 4,093,486, Cl. 156-244.190.

Pelensky, Joseph: *See—*
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Pepelin, Boris Alexeevich: *See—*
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.

Pepperl, Rudiger; Kruger, Johann; and Hill, Bernhard, to U.S. Philips Corporation. Optical multi-channel digital disc storage system. 4,094,010, Cl. 365-215.000.

Pepperl, Rudiger: *See—*
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, 4,094,013, Cl. 365-234.000.

Peppiatt, Harry J.; and Roberts, Gerald E., to General Electric Company. Method of measuring parameters of a crystal filter. 4,093,914, Cl. 324-56.000.

PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques: *See—*
Clapot, Claude; Vial, Jean; and Dumont, Louis, 4,093,444, Cl. 71-92.000.

Peradejordi Guanabens, Jose de Calasanz: *See—*
Marcet, Jose Maria Maso; and Peradejordi Guanabens, Jose de Calasanz, 4,093,292, Cl. 294-74.000.

Perchonock, Carl David, to SmithKline Corporation. Tricyclic β-lactams. 4,093,807, Cl. 544-183.000.

Perkins, Charles W.; and Rohringer, Gerhard. Controlled flexible membrane reflector. 4,093,351, Cl. 350-310.000.

Perlegos, George; and Salsbury, Phillip J., to Intel Corporation. Electrically programmable MOS read-only memory with isolated decoders. 4,094,012, Cl. 365-226.000.

Perr, Julius P., to Cummins Engine Company, Inc. Exhaust braking apparatus. 4,093,046, Cl. 188-273.000.

Perry, Sarah H.: *See—*
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., 4,093,696, Cl. 264-295.000.

Persson, Ray S. Coaster brake for bicycle with derailleur speed change mechanism. 4,093,261, Cl. 280-241.000.

Peters, Kenneth Donald, to RCA Corporation. Disc caddy and disc player system therefor. 4,093,152, Cl. 274-9.00R.

Petersen, Tom Lindhardt. Coil spring device. 4,093,198, Cl. 267-179.000.

Peterson, Thomas Eben: *See—*
Kelman, Arnold Lloyd; and Peterson, Thomas Eben, 4,093,861, Cl. 250-445.00T.

Petrenko, Andrei Viktorovich: *See—*
Vasiliev, Jury Nikolaevich; Petrenko, Andrei Viktorovich; Bagrov, Georgy Nikolaevich; Gordeeva, Galina Nikolaevna; Kazintsev, Timur Isaakovich; Telegin, Vasily Dmitrievich; and Goldfain, Vitaly Naumovich, 4,093,578, Cl. 260-28.00P.

Petrie, Jerome Urban: *See—*
Masog, Charles Raymond; Petrie, Jerome Urban; and Mishima, Yasutsugu, 4,093,983, Cl. 364-200.000.

Petrucci, Pasquale M.: *See—*
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Pfahler, Gerhard: *See—*
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Pfizer Inc.: *See—*
Kuhla, Donald E., 4,093,616, Cl. 544-344.000.

Pflug, Gunther: *See—*
Kirsch, Kurt; Hilzensauer, Volkmar; Pflug, Gunther; Wehrmann, Felix; and Maresch, Gerald, 4,093,488, Cl. 156-245.000.

Philip Morris Incorporated: *See—*
Osdene, Thomas S.; and Sanders, Edward B., 4,093,620, Cl. 260-291.000.
Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., 4,092,988, Cl. 131-17.00R.

Phillipps, Gordon H.; and Bain, Brian M., to Glaxo Laboratories Limited. Pharmaceutical compositions of 6α,9α-difluoro-androst-4-ene-17β-carboxylates and derivatives thereof. 4,093,721, Cl. 424-243.000.

Phillips, John M. Perforated self-draining meatloaf baking pan. 4,092,909, Cl. 99-444.000.

Phillips Petroleum Company: *See—*
Habeger, Charles C., Jr.; and Quy, Dennis A., 4,093,947, Cl. 340-324.0AD.
Heckelsberg, Louis F., 4,093,536, Cl. 208-121.000.
Kile, Stephen A.; and Jones, Rufus V., 4,093,004, Cl. 138-140.000.
Kraus, Gerard; Stacy, Carl J.; and Cheng, Paul J., 4,093,705, Cl. 423-450.000.
Murtha, Timothy P.; Jones, William A.; and Zuech, Ernest A., 4,093,671, Cl. 260-668.00R.
Stapp, Paul R., 4,093,815, Cl. 560-246.000.

Phytox Corporation: *See—*
Wayland, James Robert, Jr.; Davis, Frank S.; and Merkle, Morris Guy, 4,092,800, Cl. 47-1.300.

Piccini, Silvio D. Batting practice device. 4,093,217, Cl. 273-26.00R.

Piccinini, Carlo; and Conti, Vincenzo, to Tecneco, S.p.A. Method for the removal of metallic mercury. 4,093,541, Cl. 210-40.000.

Pickles, Wilfred: *See—*
Randell, Donald Richard; and Pickles, Wilfred, 4,093,680, Cl. 260-966.000.

Pieper, Helmut: *See—*
Kruger, Gerd; Keck, Johannes; Noll, Klaus Reinhold; Pieper, Helmut; Ziegler, Harald; Ballhause, Helmut; and Kahling, Joachim, 4,093,734, Cl. 424-274.000.

Pierce, Franklin K. Water dumping target game. 4,093,228, Cl. 273-102.10G.

Pietsch, Wolfgang B., to Midrex Corporation. Compacted, passivated metallized iron product. 4,093,455, Cl. 75-256.000.

Pigott, Neil: *See—*
Spenceley, Gene Donald; and Pigott, Neil, 4,093,452, Cl. 75-53.000.

Pilkington Brothers Limited: *See—*
Greig, Ian Robert Kennedy, 4,093,471, Cl. 106-99.000.

Pillsbury Company, The: *See—*
Leezer, James R., 4,093,073, Cl. 206-606.000.

Pinckney Molded Plastics, Inc.: *See—*
Stahl, Edward L., 4,093,070, Cl. 206-507.000.
Stahl, Edward L.; and Sanders, Ellsworth E., 4,093,071, Cl. 206-507.000.

Pioneer Electronic Corporation: *See—*
Kanamaru, Hitoshi, 4,093,961, Cl. 358-128.000.

Piraud, Jean-Daniel, to Societe de Transformation du Caoutchouc-Sotrac. Balls for sport. 4,093,219, Cl. 273-65.00B.

Pisar, Robert J. Window adapted to be flooded with liquid. 4,093,352, Cl. 350-312.000.

Pittman, Robert B., to Industrial Electronic Hardware. Circuit chip receptacle. 4,093,330, Cl. 339-17.0CF.

Pizzini, Louis C.: *See—*
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T.; and Murphy, John R., 4,093,573, Cl. 260-2.5BE.

Plasmine Corporation, The: *See—*
Emerson, Ralph Waldo; and Shattuck, John R., 4,093,779, Cl. 428-411.000.

Plastic Products, Inc.: *See—*
Jacobs, Lawrence O'Quinn, 4,093,483, Cl. 156-227.000.

Plastics Research Corporation: *See—*
Black, Robert R., Jr., 4,093,072, Cl. 206-521.000.

Plastimer: *See—*
Chippaux, Andre, 4,093,794, Cl. 526-344.000.

Plate Bonn Gesellschaft Mit Beschrankter Haftung: *See—*
Raabe, Fritz; and De Jong, Eduard, 4,093,492, Cl. 156-331.000.

Plessey Handel und Investments AG: *See—*
Carter, Christopher Frederick; Blunt, Roy Trevor; Lewis, James Cyril Alexander; and Garner, Geoffrey Michael, 4,093,534, Cl. 350-355.000.
Taylor, Frank Howard, 4,093,952, Cl. 343-108.00R.

Plueddemann, Edwin P., to Dow Corning Corporation. Preparation of silylalkyl esters of phosphorus. 4,093,641, Cl. 260-448.20E.

Plumb, George Arthur; Bushell, John Leo Thomas; and Radford, Patrick Louis, to P.C. Compteurs Limited. Correction circuit. 4,093,871, Cl. 307-106.000.

Plumer, John A., Jr., to General Electric Company. Method and apparatus for protecting electrical systems from lightning strike effects. 4,093,978, Cl. 361-118.000.

Plunkett, Allan Barr, to General Electric Company. Dynamic brake blending for an inverter propulsion system. 4,093,900, Cl. 318-370.000.

Poff, James S. Rising stem valve position indicator. 4,093,000, Cl. 137-554.000.

Polansky, Henry J., to Tire Recycling of Minnesota, Inc. Machine to comminute refuse. 4,093,129, Cl. 241-186.00R.

Polaroid Corporation: *See—*
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., 4,093,696, Cl. 264-295.000.

Polashak, Gerald L., to Clark Equipment Company. Clutch assembly-disassembly tool. 4,092,770, Cl. 29-263.000.

Politechnika Gdanska: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Politechnika Slaska: *See—*
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Pollitt, Glenn A., to GTE Lenkurt Electric (Canada) Ltd. Constant impedance MOSFET switch. 4,093,874, Cl. 307-251.000.

Pollmeier, Werner, to Nixdorf Computer AG. Semi-conductor switching circuit with transistor switching power loss reduction means. 4,093,877, Cl. 307-270.000.

Polyak, George, Jr. Heat exchanger. 4,093,022, Cl. 165-39.000.

Polychrome Corporation: *See—*
Chu, Simon L.; and Golda, Eugene, 4,093,465, Cl. 96-115.00R.

POMA 2000 S.A.: *See—*
Laurent, Roger, 4,092,929, Cl. 104-173.00R.

Ponjee, Johannes J.; and Feil, Hendrik J., to U.S. Philips Corporation. Method for producing electrically conductive indium oxide patterns on an insulating support by etching with hydrochloric acid and ferric chloride. 4,093,504, Cl. 156-656.000.

Ponomarev, Alexei Ivanovich: *See—*
Belous, Viktor Mikhailovich; Yagupolsky, Lev Moiseevich; Alexeeva, Ljubov Antonovna; Sokolov, Sergei Vasilievich; and Ponomarev, Alexei Ivanovich, 4,093,665, Cl. 260-612.00D.

Poore, Thomas C., to J.P. Stevens & Co., Inc. Air guide plate. 4,092,763, Cl. 19-98.000.

Popplewell, James M.: *See—*
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,093,782, Cl. 428-654.000.

Porter, Samuel, Jr.: *See—*
Chang, Wen-Hsuan; Dowbenko, Rostyslaw; Hartman, Marvis E.; and Porter, Samuel, Jr., 4,093,673, Cl. 260-824.0EP.

Portnoff, Joel B., to Merck & Co., Inc. Parenteral suspensions. 4,093,733, Cl. 424-274.000.

Portz, William E., to True Temper Corporation. Pendulum type hoe. 4,093,031, Cl. 172-372.000.

Pospischil, Rudolf: *See—*
Hahn, Alfred; Steiner, Ernst; and Pospischil, Rudolf, 4,093,864, Cl. 250-505.000.

Post Office: *See—*
Gladstone, David John; and Moldram, Peter Andrew, 4,093,825, Cl. 179-15.0BS.

Povejsil, James Harrie, to Towmotor Corporation. Throttle control slider. 4,092,876, Cl. 74-478.000.

PPG Industries, Inc.: *See—*
Briar, Thomas J.; and Reese, Walter J., 4,093,137, Cl. 242-46.400.
Chang, Wen-Hsuan; Dowbenko, Rostyslaw; Hartman, Marvis E.; and Porter, Samuel, Jr., 4,093,673, Cl. 260-824.0EP.
Cunningham, Hugh, 4,093,525, Cl. 204-98.000.
Jeffery, Thomas C.; and Graybill, Wilmer B., 4,092,846, Cl. 73-29.000.
Rowley, James R.; and Majesky, Paul D., 4,092,815, Cl. 53-3.000.

Pradon, Jacques. Locking gripper. 4,093,042, Cl. 188-67.000.

Precision Cosmet Co., Inc.: *See—*
Erickson, Charles E.; and Neogi, Amar N., 4,093,361, Cl. 351-160.000.

Precision Flexmold, Inc.: *See—*
Putzer, Raymond M.; and Maurino, William J., 4,093,175, Cl. 249-153.000.

Preiss, Michael: *See—*
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,093,722, Cl. 424-246.000.

Prelec, Krsto: *See—*
Kobayashi, Maasaki; Prelec, Krsto; and Sluyters, Theodorus J, 4,093,858, Cl. 250-424.000.

Prephar Prospection de Recherches Pharmaceutiques S.A.: *See—*
Butti, Adriano; and Gazzani, Giovanni, 4,093,730, Cl. 424-270.000.

Prew, Stanley Robert, to Koppers Company, Inc. Twin refiner apparatus. 4,093,130, Cl. 241-245.000.

Prewarski, Mike. Tennis racket string network. 4,093,220, Cl. 273-73.00D.

Prewitt, Richard H.: *See—*
Prewitt, Richard H., Jr.; and Prewitt, Richard H., 4,093,954, Cl. 346-7.000.

Prewitt, Richard H., Jr.; and Prewitt, Richard H. Motion recorder indicator. 4,093,954, Cl. 346-7.000.

Pries, Erich, to Dr. C. Otto & Comp. G.m.b.H. Decarbonizing apparatus for an underjet-type of coke oven battery. 4,093,519, Cl. 202-241.000.

Priestle, Robert W., to Raymond Lee Organization, Inc., The. Dinkey game. 4,093,226, Cl. 273-95.00F.

Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Motion picture projector. 4,093,363, Cl. 352-104.000.

Proctor, David, to United States of America, Navy. Microstrip hybrid ring coupler. 4,093,928, Cl. 333-11.000.

Proctor, Miles W.: *See—*
Barber, Thomas W.; and Proctor, Miles W., 4,093,409, Cl. 425-59.000.

Prodi, Vittorio; Melandri, Carlo; Tarroni, Giuseppe; Formignani, Massimo; De Zaiacomo, Tonino; and Bompane, Gianfranco, to Comitato Nazionale per l'Energia Nucleare — Cnen. Lung simulating aerosol sampler. 4,092,845, Cl. 73-28.000.

Produits Chimiques Pechiney-Saint-Gobain: *See—*
Muller, Francois, 4,093,638, Cl. 260-408.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Champenois, Michel Maurice Luce, 4,093,793, Cl. 526-221.000.
Schirmann, Jean Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 4,093,656, Cl. 260-566.00B.

Prokai, Bela: *See—*
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Prosen, Gildo, to Vortac, Inc. Fuel vaporizing and mixing device for gasoline engines. 4,092,966, Cl. 123-141.000.

Provenzale, Luciano: *See—*
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Prudovoi, Viktor Alexeevich: *See—*
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich, 4,093,189, Cl. 259-7.000.

Prusoff, H. William: *See—*
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Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., 4,093,716, Cl. 424-180.000.

Pryde, Everett H.: *See—*
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Publishers Planning Inc.: *See—*
Barry, Dennis P., 4,093,235, Cl. 273-254.000.

Puchy, David Peter William. Sealing washer. 4,092,896, Cl. 85-50.00R.

Purrmann, Robert: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,093,555, Cl. 252-188.30R.
Putzer, Raymond M.; and Maurino, William J., to Precision Flexmold, Inc. Distensible elastomeric molds. 4,093,175, Cl. 249-153.000.
Qualitrol Corporation: *See—*
Romanowski, Robert F., 4,092,864, Cl. 73-363.000.
Quan, Peter Michael: *See—*
Bamfield, Peter; Quan, Peter Michael; and Smith, Trevor James, 4,093,646, Cl. 260-508.000.
Quandt, Gerhard; and Ries, Werner, to Teldix GmbH. Rotor bearing. 4,093,323, Cl. 308-121.000.
Quigley, Joseph R.: *See—*
Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., 4,093,451, Cl. 75-43.000.
Quy, Dennis A.: *See—*
Habeger, Charles C., Jr.; and Quy, Dennis A., 4,093,947, Cl. 340-324.0AD.
R. A. Jones & Co. Inc.: *See—*
Greenwell, Joseph Daniel; Hughes, Charles C.; and Kinney, Robert W., 4,093,207, Cl. 271-3.100.
R. W. Mac Company: *See—*
MacDonnell, Robert W., 4,092,932, Cl. 105-207.000.
Raabe, Fritz; and De Jong, Eduard, to Plate Bonn Gesellschaft Mit Beschrankter Haftung. Copolyamides containing caprolactam, lauriclactam and 11-aminoundecanoic acid. 4,093,492, Cl. 156-331.000.
Rabindran, Karavattuveetil George; and Flint, John R., to Bell & Howell Company. Automatic exposure control. 4,093,376, Cl. 355-68.000.
Rachor, Lothar: *See—*
Hrovat, Milan; and Rachor, Lothar, 4,093,682, Cl. 264-0.500.
Racki, Francis R.: *See—*
Bohinc, Richard J.; Tragesser, Charles W.; Vaill, Ronald E.; and Racki, Francis R., 4,093,837, Cl. 200-150.00G.
Radd, Fred J.: *See—*
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Rade, Dieter: *See—*
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Plumb, George Arthur; Bushell, John Leo Thomas; and Radford, Patrick Louis, 4,093,871, Cl. 307-106.000.
Raidel, John E. Unitary lift and spring vehicular suspension. 4,093,272, Cl. 280-686.000.
Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. (Nitrofuryl)pyrazoles, their synthesis and use, and compositions containing them. 4,093,812, Cl. 548-374.000.
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T.; and Murphy, John R., to BASF Wyandotte Corporation. Low-viscous, stable polymer dispersions and polyurethanes prepared therefrom. 4,093,573, Cl. 260-2.5BE.
Randall, James D.: *See—*
Double, Glen P.; Kahwaty, Vincent N.; Randall, James D.; and Reinhart, Fritz M., 4,093,912, Cl. 324-.5MA.
Randell, Donald Richard; and Pickles, Wilfred, to Ciba-Geigy AG. Phosphorylated tertiary butylated phenol/phenol ester reaction mixtures. 4,093,680, Cl. 260-966.000.
Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. 2-Aryl-4-cyanomethyl-5-methylimidazoles. 4,093,811, Cl. 548-342.000.
Raybon, Charles L., to Time Saver Industries, Inc. Apparatus for simulating intersecting structural elements. 4,092,782, Cl. 33-174.00N.
Rayle, Roy E., to Avco Corporation. Delay arming mechanism for fuzes. 4,092,927, Cl. 102-229.000.
Raymond Lee Organization, Inc., The: *See—*
Gatewood, Ralph M., 4,093,298, Cl. 294-118.000.
Kelling, Richard C., 4,093,229, Cl. 273-106.50R.
Priestle, Robert W., 4,093,226, Cl. 273-95.00F.
Raytheon Company: *See—*
Lapidus, Stanley N., 4,093,857, Cl. 250-369.000.
Ouellette, Charles W., 4,093,935, Cl. 340-8.00S.
Razdymakha, Pavel Semenovich: *See—*
Suslin, Vladimir Isaakovich; Dubovik, Alexandr Ivanovich; Makeev, Boris Anatolievich; Razdymakha, Pavel Semenovich; and Lekarev, Zinovy Abramovich, 4,093,530, Cl. 204-224.00M.
RCA Corporation: *See—*
Hedlund, Lee Vern, 4,093,959, Cl. 358-4.000.
Peters, Kenneth Donald, 4,093,152, Cl. 274-9.00R.
Ready Metal Manufacturing Company: *See—*
Radek, John R., 4,093,078, Cl. 211-189.000.
Recognition Equipment Incorporated: *See—*
Bryan, Larry Wayne; Himmel, David Paul; and Woster, George William, Jr., 4,093,941, Cl. 340-146.3AE.
Recordati S.A. Chemical and Pharmaceutical Company: *See—*
Sianesi, Enrico; Bonola, Giuseppe; Setnikar, Ivo; and Magistretti, Maria Jose, 4,093,648, Cl. 260-519.000.
Redden, David N.: *See—*
Zucker, Edwin; Shogren, David K.; and Redden, David N., 4,093,374, Cl. 355-57.000.
Reddy, Junuthula N., to Bendix Corporation, The. Roughness sensor. 4,092,955, Cl. 123-32.0EA.
Reed International Limited: *See—*
Briston, Rodney J.; and Canning, Rodger G., 4,093,686, Cl. 264-45.500.
Rees, James G.: *See—*
Page, William R.; and Rees, James G., 4,093,315, Cl. 303-59.000.
Reese, Walter J.: *See—*
Briar, Thomas J.; and Reese, Walter J., 4,093,137, Cl. 242-46.400.
Regie Nationale Des Usines Renault: *See—*
Boutant, Jean-Jacques, 4,093,244, Cl. 277-153.000.
Reiber, Edwin E., to North American Systems, Inc. Grasping device. 4,093,297, Cl. 294-99.00R.
Reighart, Ray R., II. Free vortex aircraft. 4,093,160, Cl. 244-199.000.
Reinecke, Erich, to WABCO Westinghouse GmbH. Combined antiskid and load-dependent brake control system for a motor vehicle. 4,093,316, Cl. 303-100.000.
Reinecke, Erich: *See—*
Lindemann, Klaus; Weise, Lutz; and Reinecke, Erich, 4,093,317, Cl. 303-111.000.
Reinhardt, Johann: *See—*
Hadi, Ali Sameh Abdel; Menzler, Peter-Michael; and Reinhardt, Johann, 4,093,697, Cl. 423-2.000.
Reinhart, Franz Karl: *See—*
Logan, Ralph Andre; Reinhart, Franz Karl; and Sinclair, William Robert, 4,093,345, Cl. 350-355.000.
Reinhart, Fritz M.: *See—*
Double, Glen P.; Kahwaty, Vincent N.; Randall, James D.; and Reinhart, Fritz M., 4,093,912, Cl. 324-.5MA.
Reischl, Artur; Jabs, Gert; and Gonzalez-Dorner, Alberto Carlos, to Bayer Aktiengesellschaft. Polyurethane resins produced from active hydrogen containing material which is a dispersion of polyisocyanate-polyaddition products in hydroxyl containing compounds as dispersing agents. 4,093,569, Cl. 260-2.5AM.
Reise, Eberhardt Karl: *See—*
Bachmann, Lothar Willy; and Reise, Eberhardt Karl, 4,093,391, Cl. 407-22.000.
Reiss, Wolfgang; Joschek, Hans-Ingo; Schnur, Rudolf; Winderl, Siegfried; Dehler, Juergen; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Manufacture of butynediol. 4,093,668, Cl. 568-855.000.
Reitz, Mathias: *See—*
Kandler, Joachim; Komorniczyk, Klaus; and Reitz, Mathias, 4,093,538, Cl. 209-172.500.
Renault, Serge Andre Maurice: *See—*
Boitel, Marius Charles; and Renault, Serge Andre Maurice, 4,093,468, Cl. 106-39.700.
Renton, Stanley; and Crowther, John Cooper. Chromium electroplating. 4,093,521, Cl. 204-43.00R.
REPA GmbH Feinstanzwerk: *See—*
Klink, Wolf-Dieter, 4,093,145, Cl. 242-107.40A.
Research Corporation: *See—*
Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., 4,093,715, Cl. 424-180.000.
Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., 4,093,716, Cl. 424-180.000.
Travis, James; and Pannell, Ralph, 4,093,612, Cl. 260-122.000.
Revankar, Ganapathi R.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 1,2,4-Thiadiazolidine-3,5-dione. 4,093,624, Cl. 260-302.00D.
Revankar, Ganapathi R.: *See—*
Tolman, Richard L.; Sidwell, Robert W.; and Revankar, Ganapathi R., 4,093,714, Cl. 424-180.000.
Reven, Frederick V.; and Connors, Charles W., to Nalco Chemical Company. Ingot mold for producing steel ingots. 4,093,778, Cl. 428-411.000.
Rheem Manufacturing Company: *See—*
Strobach, Carl G., 4,093,529, Cl. 204-197.000.
Rhone - Poulenc Industries: *See—*
Bost, Pierre-Etienne; and Costantini, Michel, 4,093,636, Cl. 260-348.290.
Ricardo & Co., Engineers (1927) Limited: *See—*
Haslett, Robert Alan, 4,092,967, Cl. 123-143.00B.
Riccio, Joseph F., Jr., to Motorola, Inc. Semiconductor device assembly with improved fatigue resistance. 4,093,958, Cl. 357-68.000.
Richter, Johan C. F. C., to Kamyr Aktiebolag. Method and apparatus for effecting even distribution and mixing of high consistency pulp and treatment fluid. 4,093,506, Cl. 162-17.000.
Richter, Johan Christoffer Fredrik Carl, to Kamyr Aktiebolag. Apparatus for oxygen bleaching of pulp including recirculation of exhaust gases. 4,093,511, Cl. 162-234.000.
Ricks, Earl C., to United States of America, Army. Clip-on sight mount. 4,092,793, Cl. 42-1.0ST.
Ridley, Richard D., to Occidental Oil Shale, Inc. Removal of sulfur dioxide from process gas using treated oil shale and water. 4,093,026, Cl. 166-256.000.
Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,093,718, Cl. 424-200.000.
Riedel-de Haen Aktiengesellschaft: *See—*
Stahl, Kurt-Wilhelm; and Schuppe, Ekkehard, 4,093,550, Cl. 210-198.00C.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Tilting drive arrangement for a converter. 4,093,192, Cl. 266-78.000.
Ries, Gunter: *See—*
Jungst, Klaus-Peter; and Ries, Gunter, 4,093,817, Cl. 174-32.000.
Ries, Werner: *See—*
Quandt, Gerhard; and Ries, Werner, 4,093,323, Cl. 308-121.000.
Rihm, Peter L. Safety bicycle seat reflector. 4,093,263, Cl. 280-289.00R.

Rikker, Mihaly: *See—*
Mayer, Gyorgy; Gyori, Janos; Rikker, Mihaly; Banfai, Antal; and Eszenyl, Ervin, 4,093,689, Cl. 264-71.000.

Rilett, John Walter. Gas driven motor with buffer space. 4,092,830, Cl. 60-671.000.

Ringer, Karl. Freight-transportation system with road/rail transshipment. 4,093,084, Cl. 214-11.00R.

Rist, Karl Frederick, III, to Minnesota Mining and Manufacturing Company. Film applying device with a straw-hole perforator. 4,092,817, Cl. 53-298.000.

Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,093,106, Cl. 221-224.000.

Ritter, Josef: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,093,106, Cl. 221-224.000.

Ritter, Klaus: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,093,106, Cl. 221-224.000.

Riva, Fernando: *See—*
Ferruti, Paolo; Martuscelli, Ezio; Riva, Fernando; and Provenzale, Luciano, 4,093,677, Cl. 260-858.000.

Robert Bosch GmbH: *See—*
Corbach, Rainer; Steinke, Leo; Benedikt, Walter; and Jurinke, Rudolf, 4,093,887, Cl. 313-140.000.
Hofer, Gerald; Eheim, Franz; and Kopse, Odon, 4,092,964, Cl. 123-139.0AT.
Schneider, Erich; Schnaibel, Eberhard; and Fleischer, Helmut, 4,092,853, Cl. 73-121.000.

Roberts, Gerald E.: *See—*
Peppiatt, Harry J.; and Roberts, Gerald E., 4,093,914, Cl. 324-56.000.

Roberts, Wallace A. High-voltage apparatus for skin therapy. 4,093,975, Cl. 363-27.000.

Robertshaw Controls Company: *See—*
Asbill, Clarence M., III, 4,093,329, Cl. 339-16.00R.

Robins, Roland K.; O'Brien, Darrell E.; and Novinson, Thomas, to ICN Pharmaceuticals, Inc. 3,5,7-Trisubstituted pyrazolo[1,5-a]pyrimidines. 4,093,617, Cl. 544-281.000.

Robins, Roland K.: *See—*
Revankar, Ganapathi R.; and Robins, Roland K., 4,093,624, Cl. 260-302.00D.

Robinson, Charles Elbert. Fencing stay system. 4,093,187, Cl. 256-49.000.

Robinson, Tom E.: *See—*
Habiger, Cyril W.; and Robinson, Tom E., 4,093,092, Cl. 214-674.000.

Rockland Systems Corporation: *See—*
Flink, Joseph H.; and Bertrand, John, 4,093,989, Cl. 364-485.000.

Rockwell International Corporation: *See—*
Chen, Thomas T., 4,094,005, Cl. 365-16.000.
Heinz, David M.; and Whitcomb, Eugene C., 4,093,781, Cl. 428-539.000.
Thompson, Robert B.; Alers, George A.; and Tennison, Marion A., 4,092,868, Cl. 73-638.000.

Rodewald, Paul G.; and Haag, Werner O., to Mobil Oil Corporation. Decomposition of formic acid in very low concentration. 4,093,543, Cl. 210-59.000.

Roe, Anthony Maitland; Slater, Robert Anthony; and Taylor, Edwin Michael, to Smith Kline & French Laboratories Limited. (3-Alkylamino-2-hydroxypropoxy)-1-hydrazinophthalazines. 4,093,725, Cl. 424-250.000.

Roestel, Jan A.: *See—*
Davis, Gregory A.; Krippner, Kenneth E.; Roestel, Jan A.; Vonk, Gottfried; and Zacher, Albert R., Jr., 4,093,859, Cl. 250-445.00T.

Rohe, Lothar: *See—*
Schmidt, Robert Rudolf; and Rohe, Lothar, 4,093,442, Cl. 71-90.000.

Rohm and Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,093,446, Cl. 71-109.000.
Hurwitz, Marvin J.; and Avery, Noyes L., 4,093,567, Cl. 260-21.00E.
Miller, George A.; and Fleischfresser, Marvin H., 4,093,655, Cl. 260-564.0RF.

Rohr Industries, Inc.: *See—*
Linderman, Duane L.; and Hom, Felix, 4,093,122, Cl. 239-127.300.

Rohringer, Gerhard: *See—*
Perkins, Charles W.; and Rohringer, Gerhard, 4,093,351, Cl. 350-310.000.

Rohrs, Marvin K., to Metalwash Machinery Corporation. Cleaning machine. 4,092,991, Cl. 134-127.000.

Rollei-Werke Franke & Heidecke: *See—*
Prochnow, Claus, 4,093,363, Cl. 352-104.000.

Rolls-Royce Limited: *See—*
Pask, George, 4,092,826, Cl. 60-39.74R.

Romanowski, Robert F., to Qualitrol Corporation. Hot spot thermometer. 4,092,864, Cl. 73-363.000.

Rooklyn, Jack. Construction of metal articles. 4,093,167, Cl. 248-188.000.

Rosch, Hubert J., to Kawasaki Motors Corp. Snowmobile suspension system. 4,093,033, Cl. 180-5.00R.

Roscher, Gunter: *See—*
Fernholz, Hans; Roscher, Gunter; Schmidt, Hans-Joachim; Schmitz, Heinz; and Wunder, Friedrich, 4,093,559, Cl. 252-443.000.

Rose, Frederick A.: *See—*
Smith, Steven R.; and Rose, Frederick A., 4,093,995, Cl. 364-900.000.

Rose, Manning I. Safety circuit and socket construction. 4,093,336, Cl. 339-180.000.

Rose, Ronald N. DC Motor speed control circuit. 4,093,901, Cl. 318-476.000.

Ross, David S., to Sterling Drug, Inc. Method and apparatus for ammonia-nitrogen removal by vacuum desorption. 4,093,544, Cl. 210-59.000.

Ross, R. Charles: *See—*
Cordts, Howard P.; Navin, Robert F.; and Ross, R. Charles, 4,093,768, Cl. 428-287.000.

Ross, Richard D.: *See—*
Wilke, William F.; Hutcheson, Alan G.; and Ross, Richard D., 4,093,223, Cl. 273-94.00R.

Rossi, Giorgio: *See—*
Abbruzzese, Luigi; Gozzo, Franco; Rossi, Giorgio; Masoero, Marcella; Lorusso, Simone; Bonola, Paola; and Tamburin, Gino, 4,093,727, Cl. 424-258.000.

Roth American, Inc.: *See—*
Tomalinas, William R., Jr., 4,093,208, Cl. 272-52.500.

Roueche, Armand: *See—*
Hari, Stefan; and Roueche, Armand, 4,093,613, Cl. 260-154.000.

Rousseau, Genevieve; and Torelli, Vesperto, to Roussel Uclaf. Novel-17-spirosultines their corresponding hydroxy acids and compositions thereof. 4,093,720, Cl. 424-241.000.

Roussel Uclaf: *See—*
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,093,724, Cl. 424-250.000.
Rousseau, Genevieve; and Torelli, Vesperto, 4,093,720, Cl. 424-241.000.

Roussy, Georges: *See—*
Jean, Olivier A.; and Roussy, Georges, 4,093,840, Cl. 219-10.55F.

Rowley, James R.; and Majesky, Paul D., to PPG Industries, Inc. Method of loading glass sheets on a collapsible rack for storing or shipping. 4,092,815, Cl. 53-3.000.

RPC Corporation: *See—*
Whiteman, Donald R., 4,093,090, Cl. 214-620.000.

Rubrich, Lawrence M., to Dana Corporation. Fluid control valve. 4,092,999, Cl. 137-504.000.

Ruckert, Hans; and Wildenhain, Barbara, to Hoechst Aktiengesellschaft. Light sensitive o-quinone diazide containing transfer composition. 4,093,464, Cl. 96-91.00D.

Ruckstuhl, Franz: *See—*
Tinnes, Bernhard; and Ruckstuhl, Franz, 4,092,771, Cl. 29-401.00F.

Rudolf, Anton: *See—*
Hudelmaier, Gerhard; and Rudolf, Anton, 4,093,085, Cl. 214-16.00R.

Rudowski, Andrzej: *See—*
Falkowski, Leonard; Bobrowski, Miroslaw; Buluk, Helena; Bylec, Elzbieta; Cybulska, Barbara; Golik, Jerzy; Kolodziejczyk, Pawel; Pawlak, Jan; Rudowski, Andrzej; Zielinski, Jan; Ziminski, Tadeusz; and Borowski, Edward, 4,093,796, Cl. 536-17.000.

Rue, John Rego, to Burrell, Charles A., a part interest. Scooter board. 4,093,252, Cl. 280-87.04A.

Rump, Bjorn Sigurd; and Dereux, Philippe Jean, to Ciba-Geigy AG. Process for printing carpets. 4,093,416, Cl. 8-2.50A.

Runnells, Robert R., to MDT Instrument Company. Dental operating chair with restraining arm supports. 4,093,308, Cl. 297-416.000.

Ruoff, Carl F., Jr.: *See—*
Henry, James L.; and Ruoff, Carl F., Jr., 4,092,854, Cl. 73-133.00R.

Rupinski, Frederick Alexander: *See—*
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,092,937, Cl. 112-121.110.

Ruppen, Bruno: *See—*
Hottinger, Conrad; Ruppen, Bruno; and Schaffner, Kurt, 4,092,900, Cl. 89-33.00B.

Russell, Walter W.; and Stoetzer, Richard P., to N. T. Gates Company. Plastic container with vent means. 4,093,105, Cl. 220-373.000.

Rutenbeck, Hugo, to August Bilstein, Firma. Vehicle jack. 4,093,182, Cl. 254-126.000.

Ruzek, Ivo: *See—*
Hartmann, Ludwig; Maahs, Paul F.; Gerking, Luder; Ruzek, Ivo; and Schafer, Eberhard, 4,093,763, Cl. 428-95.000.

Rybicki, Robert Charles, to United Technologies Corporation. Cross beam rotor. 4,093,400, Cl. 416-141.000.

Ryobi, Ltd.: *See—*
Morishita, Yasomatsu, 4,093,144, Cl. 242-84.52A.

S&C Electric Company: *See—*
Stranczek, Norman J., 4,093,834, Cl. 200-50.00A.

S&S Corrugated Paper Machinery Co., Inc.: *See—*
Leff, Martin J., 4,093,497, Cl. 156-473.000.

Sabatella, Robert J.: *See—*
M'Sadoques, Andre J.; and Sabatella, Robert J., 4,093,970, Cl. 361-361.000.

Sack GmbH: *See—*
Hansen, Manfred W.; and Kersting, Emil F., 4,092,891, Cl. 83-341.000.

Sagami Chemical Research Center: *See—*
Kojima, Takakazu; and Ohtsuka, Yozo, 4,093,810, Cl. 548-321.000.

St. Francis Hospital, Inc.: *See—*
Gowing, Ellis, 4,092,788, Cl. 35-17.000.

Saint Gobain Industries: *See*—
Coulon, Jean-Claude; and Amannati, Piero, 4,093,439, Cl. 65-65.000.

Saito, Kyuta; and Ishino, Fukuya, to Nippon Telegraph and Telephone Public Corporation. Closed user group facility. 4,093,819, Cl. 178-2.00R.

Saito, Yuichi; and Mayama, Osamu, to Mitsubishi Kinzoku Kabushiki Kaisha. Nickel-base sintered alloy. 4,093,454, Cl. 75-236.000.

Saitoh, Shigeru: *See*—
Takemura, Tooji; Saitoh, Shigeru; and Hamada, Mitsuharu, 4,092,930, Cl. 104-247.000.

Sakai, Takeo: *See*—
Araki, Eimi; Sakai, Takeo; Takai, Seizaburo; and Komori, Sekiro, 4,093,425, Cl. 44-10.00F.

Salem, Nazih M. N. Therapeutic wrap. 4,092,982, Cl. 128-82.100.

Salsbury, Phillip J.: *See*—
Perlegos, George; and Salsbury, Phillip J., 4,094,012, Cl. 365-226.000.

Sampson, Ronald N.; and Sanjana, Zal N., to Westinghouse Electric Corp. Plastic drag reducing surfacing material. 4,093,268, Cl. 280-610.000.

Sand, Leonard B., to Zeochem Corporation. Synthetic zeolite. 4,093,699, Cl. 423-118.000.

Sanders, Edward B.: *See*—
Osdene, Thomas S.; and Sanders, Edward B., 4,093,620, Cl. 260-291.000.

Sanders, Ellsworth E.: *See*—
Stahl, Edward L.; and Sanders, Ellsworth E., 4,093,071, Cl. 206-507.000.

Sandin, Billy F. E., to AB Kalle-Regulatorer. Excess flow valve. 4,093,001, Cl. 137-495.000.

Sandner, Michael Ray: *See*—
Trecker, David John; and Sandner, Michael Ray, 4,093,661, Cl. 260-595.000.

Sandoz, Inc.: *See*—
Sass, Robert N.; and Wie, Chwang Tek, 4,093,710, Cl. 424-44.000.

Sanford, Leon M.; and Wu, Che-Kuang, to Corning Glass Works. Molded glass articles having bulk homogeneity and optical quality surface. 4,093,469, Cl. 106-53.000.

Sanjana, Zal N.: *See*—
Sampson, Ronald N.; and Sanjana, Zal N., 4,093,268, Cl. 280-610.000.

Sano, Toshio: *See*—
Hamanaka, Michito; Sano, Toshio; and Kumura, Noriharu, 4,093,518, Cl. 195-142.000.

Sansho Co., Ltd.: *See*—
Shiro, Sonobe, 4,092,823, Cl. 58-125.00C.

Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin synthesis. 4,093,609, Cl. 260-112.50S.

Sarkar, Kshitindra Mohan: *See*—
Doyle, Barry N.; Seibt, Willie H.; Sarkar, Kshitindra Mohan; and Benz, Mark R., 4,093,450, Cl. 75-0.5AA.

Sass, Robert N.; and Wie, Chwang Tek, to Sandoz, Inc. Rapid dissolving effervescent granules. 4,093,710, Cl. 424-44.000.

Sassi, Frank V.: *See*—
Mayer, Edward A.; and Sassi, Frank V., 4,092,959, Cl. 123-119.00A.

Sassmannshausen, Gunter; and Hasenauer, Dieter, to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn. Lighter lead storage battery. 4,093,785, Cl. 429-149.000.

Sato, Kazuyuki, to Tokyo Shibaura Electric Co., Ltd. Bit-slice type large scale integrated circuit with multiple functions on a one-chip semiconductor device. 4,093,993, Cl. 364-712.000.

Sato, Masato: *See*—
Tanabe, Yasuo; Toriya, Jun; Sato, Masato; and Shiraga, Ken, 4,093,633, Cl. 260-346.110.

Satou, Takateru; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,093,967, Cl. 360-132.000.

Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,093,632, Cl. 260-345.500.

Saunders Archery Co.: *See*—
Saunders, Charles A.; and Saunders, Thomas Allen, 4,093,227, Cl. 273-102.10E.

Saunders, Charles A.; and Saunders, Thomas Allen, to Saunders Archery Co. Target with improved shock absorber means. 4,093,227, Cl. 273-102.10E.

Saunders, James Edwin: *See*—
Watson, Kenneth; and Saunders, James Edwin, 4,093,049, Cl. 192-47.000.

Saunders, Thomas Allen: *See*—
Saunders, Charles A.; and Saunders, Thomas Allen, 4,093,227, Cl. 273-102.10E.

Savvin, Sergei Borisovich: *See*—
Bratslavskaya, Alla Lvovna; Makarova, Serafima Borisovna; Mushy, Roman Yakovlevich; Myasoedova, Galina Vladimirovna; Savvin, Sergei Borisovich; and Seraya, Vera Ivanovna, 4,093,792, Cl. 526-200.000.

Sayer, Trevor Anthony, to Burroughs Corporation. Apparatus for use in depositing articles in a receptacle and a sequence controller utilized therein. 4,092,934, Cl. 109-24.100.

Schaefer, Eberhard: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,092,784, Cl. 34-13.000.

Schafer, Eberhard: *See*—
Hartmann, Ludwig; Maahs, Paul F.; Gerking, Luder; Ruzek, Ivo; and Schafer, Eberhard, 4,093,763, Cl. 428-95.000.

Schafer, Hans: *See*—
Hausberg, Gerhard; Hegemann, Karl-Rudolf; Finger, Gunther; Schafer, Hans; and Weissert, Helmut, 4,093,434, Cl. 55-226.000.

Schaffner, Kurt: *See*—
Hottinger, Conrad; Ruppen, Bruno; and Schaffner, Kurt, 4,092,900, Cl. 89-33.00B.

Schelkmann, Wilhelm, to Vakuum Vulk Holdings Limited. Method for retreading and repairing vehicle tires. 4,093,481, Cl. 156-95.000.

Scher, Herbert I.; Lex, Joseph A.; and Ungar, Israel S., to Exxon Research and Engineering Company. Three-color high pressure decorative laminate having registered color and embossing. 4,093,766, Cl. 428-165.000.

Schering Corporation: *See*—
Nafissi-Varchei, Mohammed Mehdi, 4,093,731, Cl. 424-270.000.
Neustadt, Bernard R., 4,093,742, Cl. 424-322.000.

Schickfluss, Rudolf: *See*—
Teige, Wolfgang; and Schickfluss, Rudolf, 4,093,585, Cl. 260-40.00P.

Schieber, John R., to Betz Laboratories, Inc. Vapor-type heat exchanger. 4,093,020, Cl. 165-1.000.

Schilling, Curtis L.; Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Surface active silicones. 4,093,642, Cl. 544-106.000.

Schirmann, Jean Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, to Produits Chimiques Ugine Kuhlmann. Process for making azines. 4,093,656, Cl. 260-566.00B.

Schlegel (UK) Limited: *See*—
Eggert, Frank, 4,092,813, Cl. 52-397.000.

Schlenker, Ralph F. Method for separating isotopes. 4,093,427, Cl. 55-17.000.

Schlichthaerle, Gottfried: *See*—
Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, 4,093,795, Cl. 528-481.000.

Schloss, Phillip Christian: *See*—
Heuer, Dale Arthur; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 4,093,982, Cl. 364-200.000.

Schlumberger Technology Corporation: *See*—
Turcotte, Ronald E.; and Wahl, John S., 4,093,854, Cl. 250-269.000.

Schmid, Frederick, to Crystal Systems, Inc. Process of cutting wafers. 4,092,972, Cl. 125-16.00R.

Schmid, Walter: *See*—
Wilfert, Karl; and Schmid, Walter, 4,093,255, Cl. 280-788.000.

Schmidt, Charles F. Power wrench. 4,093,179, Cl. 251-133.000.

Schmidt, Frank P., to Scott Paper Company. Soft absorbent fibrous web and disposable diaper including same. 4,093,765, Cl. 428-134.000.

Schmidt, Hans-Joachim: *See*—
Fernholz, Hans; Roscher, Gunter; Schmidt, Hans-Joachim; Schmitz, Heinz; and Wunder, Friedrich, 4,093,559, Cl. 252-443.000.

Schmidt, Manfred: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,093,192, Cl. 266-78.000.

Schmidt, Robert Rudolf; and Rohe, Lothar, to Bayer Aktiengesellschaft. Synergistic herbicidal compositions comprising 3-(benzthiazol-2-yl)-1,3-dimethylurea and a substituted diphenyl ether. 4,093,442, Cl. 71-90.000.

Schmitt, James L.: *See*—
Curley, Francis M.; and Schmitt, James L., 4,093,034, Cl. 180-53.00R.

Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Production of dental models and tooth replacement parts. 4,093,555, Cl. 252-188.30R.

Schmitz, Alfons F.; and Dixon, Douglas L., to Eastman Kodak Company. Method and apparatus to reduce waste yarn during tie-up of yarn winders. 4,093,134, Cl. 242-18.0PW.

Schmitz, Heinz: *See*—
Fernholz, Hans; Roscher, Gunter; Schmidt, Hans-Joachim; Schmitz, Heinz; and Wunder, Friedrich, 4,093,559, Cl. 252-443.000.

Schmon, Franz: *See*—
Ledeen, Howard L.; Schmon, Franz; and Tupker, Willem E., 4,092,877, Cl. 74-625.000.

Schnaibel, Eberhard: *See*—
Schneider, Erich; Schnaibel, Eberhard; and Fleischer, Helmut, 4,092,853, Cl. 73-121.000.

Schneider, David: *See*—
Davis, Paul; and Schneider, David, 4,093,041, Cl. 186-1.00D.

Schneider, Erich; Schnaibel, Eberhard; and Fleischer, Helmut, to Robert Bosch GmbH. Testing rotary movement-electrical signal transducer system, particularly for vehicle wheel anti-block transducer systems. 4,092,853, Cl. 73-121.000.

Schneider, Gerald J. Apparatus for aerial water acquisition and sub-sea aqueduct. 4,092,827, Cl. 60-398.000.

Schneider, Peter; and Goettler, Ernst, to Siemens Aktiengesellschaft. Storage arrangement with modules consisting of CCD stores. 4,094,009, Cl. 365-183.000.

Schneiderman, Max, to Ipco Hospital Supply Corporation (Whaledent International Division). Constant output electrosurgical unit. 4,092,986, Cl. 128-303.140.

Schnur, Rudolf: *See*—
Reiss, Wolfgang; Joschek, Hans-Ingo; Schnur, Rudolf; Winderl, Siegfried; Dehler, Juergen; and Hoffmann, Herwig, 4,093,668, Cl. 568-855.000.

Schoenewaldt, Erwin F.; and Sohar, Paul, to Merck & Co., Inc. Process for preparing monomer of bile acid sequestrant polymer. 4,093,657, Cl. 260-567.60M.

Schoenherr, Leonard H.; and Drablowski, William J., to Schoenherr, Leonard H. Fresh flower support. 4,092,801, Cl. 47-41.120.

Schollhorn, Wolfgang; and Ehret, Urban, to Gebruder Buhler AG. Automated apparatus for molding or die casting. 4,093,413, Cl. 425-110.000.

Scholz, Hansjurgen; Gimbel, Jurgen; and Jahn, Walter, to Daimler-Benz Aktiengesellschaft. Upper fitting of a shoulder strap arranged displaceable in height within a body hollow space. 4,093,274, Cl. 280-747.000.

Schrader, Milford J. Expansible trough apparatus for use in producing polyurethane foam. 4,093,109, Cl. 222-527.000.

Schreiber, Larry Donald, to Deere & Company. Means for retaining a piston on a piston rod. 4,092,904, Cl. 91-395.000.

Schrimpf, Carl F.; and Van Rens, Russel J., to Outboard Marine Corporation. Multistage fluid-actuated diaphragm pump with amplified suction capability. 4,093,403, Cl. 417-246.000.

Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Sulfonylimidazolidone substituted cephalosporins, antibacterial compositions containing them, and methods of combatting bacteria employing them. 4,093,722, Cl. 424-246.000.

Schroder, Dieter: *See—*
Sinn, Hartmut; Schroder, Dieter; and Stallmann, Hans, 4,093,118, Cl. 233-26.000.

Schroeder, Franklin Theodore: *See—*
McAllister, John P.; Schroeder, Franklin Theodore; and Stimson, Charles Terrance, 4,093,981, Cl. 364-200.000.

Schroeder, Larry Lloyd: *See—*
Heuer, Dale Arthur; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 4,093,982, Cl. 364-200.000.

Schroter, Herbert: *See—*
Griesch, Dorothee; Schroter, Herbert; Schwagler, Peter; and Stein, Eckehard, 4,093,375, Cl. 355-68.000.

Schuler, Roland: *See—*
Liptak, Gabor; and Schuler, Roland, 4,093,881, Cl. 310-214.000.

Schulmerich Carillons, Inc.: *See—*
Beach, Ronald O., 4,092,893, Cl. 84-1.110.

Schulz, Johann G. D.: *See—*
Onopchenko, Anatoli; and Schulz, Johann G. D., 4,093,660, Cl. 260-591.000.

Schuppe, Ekkehard: *See—*
Stahl, Kurt-Wilhelm; and Schuppe, Ekkehard, 4,093,550, Cl. 210-198.00C.

Schure, Ralph M.; Kooi, John H.; and Brown, John M., to Unitech Chemical Inc. High peel strength adhesives. 4,093,675, Cl. 260-835.000.

Schurger, Rainer: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,093,053, Cl. 192-98.000.

Schurgin, Herbert L. Contact lens application and removal instrument. 4,093,291, Cl. 294-1.0CA.

Schwab, James J.; and Goodson, David B., to Air Pollution Systems, Incorporated. Apparatus for ionizing gases, electrostatically charging particles, and electrostatically charging particles or ionizing gases for removing contaminants from gas streams. 4,093,430, Cl. 55-107.000.

Schwagler, Peter: *See—*
Griesch, Dorothee; Schroter, Herbert; Schwagler, Peter; and Stein, Eckehard, 4,093,375, Cl. 355-68.000.

Schwalm, Donald J., to Holcroft & Company. Carburizing furnace. 4,093,195, Cl. 266-251.000.

Schwartz, Albert B., to Mobil Oil Corporation. Catalytic cracking process. 4,093,535, Cl. 208-120.000.

Schwartz, Alfred Alexander: *See—*
Hogan, Walter John; Schwartz, Alfred Alexander; and Stewart, Joseph Robert, 4,093,996, Cl. 364-900.000.

Schwartz, Oscar H.; and Le Donne, Daniel A., to Automatic Connector, Inc. Electrical connectors for coaxial cables. 4,093,335, Cl. 339-177.00E.

Schwarzkopf, Anton, to Anton Schwarzkopf, Stahl- und Fahrzeuqbau. Vehicular train. 4,093,080, Cl. 213-75.00R.

Schweitzer, Roy C., to Addressograph-Multigraph Corporation. Lithographic ink supply. 4,092,922, Cl. 101-363.000.

Scott, Dale K.: *See—*
Calvert, Rodney K.; and Scott, Dale K., 4,093,063, Cl. 198-425.000.

Scott, David I., to General Motors Corporation. Ported engine cylinder with selectively hardened bore. 4,093,842, Cl. 219-121.0LM.

Scott, Gerald R.: *See—*
Smith, Garland Y.; and Scott, Gerald R., 4,093,393, Cl. 408-67.000.

Scott Paper Company: *See—*
Schmidt, Frank P., 4,093,765, Cl. 428-134.000.

Scott, Paul F., to General Electric Company. High speed frequency response measurement. 4,093,988, Cl. 364-484.000.

Scudder, Robert M.: *See—*
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.

Sealy, Incorporated: *See—*
Klancnik, Alvin R., 4,092,749, Cl. 5-267.000.

Sears, James Kern, to Monsanto Company. Dye solvents for pressure-sensitive copying systems. 4,093,278, Cl. 282-27.500.

Sears Manufacturing Company: *See—*
Carter, John W.; and Koutsky, L. John, 4,093,197, Cl. 267-131.000.

Sedam, Jason K.: *See—*
Mitchell, Charles Ronald; and Sedam, Jason K., 4,093,066, Cl. 198-861.000.

Seefeld, Dean E.: *See—*
Burrough, Donald E.; and Seefeld, Dean E., 4,092,914, Cl. 100-88.000.

Seibt, Willie H.: *See—*
Doyle, Barry N.; Seibt, Willie H.; Sarkar, Kshitindra Mohan; and Benz, Mark R., 4,093,450, Cl. 75-0.5AA.

Seidenberg, Richard L.: *See—*
Mohrman, Richard C.; and Seidenberg, Richard L., 4,093,360, Cl. 351-13.000.

Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; and Yokoyama, Shigeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for production of perfluorocarbon type cation exchange membrane. 4,093,568, Cl. 260-2.20R.

Sela, Michael; Arnon, Ruth; Maron, Ruth; and Hurvitz, Esther, to Yeda Research and Development Co., Ltd. Immunologic chemotherapeutic agents comprising antigen binding dimers covalently bound to drugs. 4,093,607, Cl. 260-112.00B.

Sen Gupta, Achintya Kumar, to Lever Brothers Company. Purification process. 4,093,540, Cl. 210-23.00F.

Serafin, Joseph W. Lathe attachment for generating spherical surfaces. 4,092,902, Cl. 90-11.00D.

Seragnoli, Enzo, to G. D. Societa Per Azioni. Inner foil wrapping device. 4,092,816, Cl. 53-234.000.

Seraya, Vera Ivanovna: *See—*
Bratslavskaya, Alla Lvovna; Makarova, Serafima Borisovna; Mushy, Roman Yakovlevich; Myasoedova, Galina Vladimirovna; Savvin, Sergei Borisovich; and Seraya, Vera Ivanovna, 4,093,792, Cl. 526-200.000.

Service D'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Imbert, Pierre, 4,092,987, Cl. 131-8.00R.

Sestanj, Kazimir; Immer, Hans Ueli; and Gotz, Manfred Karl, to Ayerst McKenna & Harrison Ltd. Dipeptide derivatives with central nervous system activity and preparation thereof. 4,093,713, Cl. 424-177.000.

Sestanj, Kazimir: *See—*
Abraham, Nedumparambil A.; Immer, Hans U.; and Sestanj, Kazimir, 4,093,610, Cl. 260-112.50R.

Setnikar, Ivo: *See—*
Sianesi, Enrico; Bonola, Giuseppe; Setnikar, Ivo; and Magistretti, Maria Jose, 4,093,648, Cl. 260-519.000.

Setra Systems, Inc.: *See—*
Briefer, Dennis K., 4,093,915, Cl. 324-60.00R.

Setzer, William C.: *See—*
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,093,474, Cl. 148-2.000.

Seuter, Antonius Maria, Josephus, Hubertus: *See—*
Verriet, Johannes Gerardus; and Seuter, Antonius Maria, Josephus, Hubertus, 4,093,890, Cl. 313-486.000.

Sevcon Limited: *See—*
Gurwicz, David, 4,093,980, Cl. 363-57.000.

Sevec, John B., to United States of America, Energy. Rotation sensor switch. 4,093,835, Cl. 200-61.45M.

Seybold, Rolf; and Gross, Gerd, to Firm Piel & Adey. Method of producing small shaped parts by casting from metal and apparatus for performing the method. 4,093,019, Cl. 164-52.000.

Shacklady, Michael: *See—*
Fuller, Paul; Gillender, John Brian; Shacklady, Michael; and Basu, Samir, 4,093,999, Cl. 364-900.000.

Shafer, Robert E. Portable holder for ribbon-like material. 4,093,138, Cl. 242-55.200.

Shah, Mahesh J.; and Mallozzi, Joseph P., to General Signal Corporation. Apparatus for automatically calibrating and testing smoke detectors. 4,093,867, Cl. 250-576.000.

Shapiro, Warren B.: *See—*
Blackburne, Owen Rodney; and Shapiro, Warren B., 4,093,711, Cl. 424-54.000.

Sharp, Walter M.; and Bergstrom, Gary E., to Business Education Products, Inc. Transcriber having selectable word reproduction rate. 4,093,831, Cl. 179-100.1VC.

Shatila, Mounir A.; VonDerLieth, William H.; Veeneman, John L.; and Thomas, Marion E., to Ampco Foods, Inc. Water nozzle for dough forming apparatus. 4,093,125, Cl. 239-553.300.

Shattuck, John R.: *See—*
Emerson, Ralph Waldo; and Shattuck, John R., 4,093,779, Cl. 428-411.000.

Shattuck, Meredith David; and Sincerbox, Glenn Tavernia, to International Business Machines Corporation. High efficiency electrochromic display device. 4,093,358, Cl. 350-357.000.

Shawaluk, Michael W.: *See—*
Karnowski, Thomas A.; and Shawaluk, Michael W., 4,093,850, Cl. 235-92.0TF.

Sheehan, John C.: *See—*
Commons, Thomas J.; Sheehan, John C.; and Lo, Young-Sek, 4,093,625, Cl. 260-306.70C.

Sheldon-Sodeco Printer, Inc.: *See—*
McInnis, Andrew M.; and Nielsen, Robert A., 4,092,921, Cl. 101-93.210.

Shell Oil Company: *See—*
McCormick, Karl, 4,093,923, Cl. 328-165.000.

Sherman, Robert M.; and Fuerst, Charles O., to Aquaria, Inc. Magnetically coupled aquarium filter. 4,093,547, Cl. 210-169.000.

Sherritt Gordon Mines Limited: *See*—
Doyle, Barry N.; Seibt, Willie H.; Sarkar, Kshitindra Mohan; and Benz, Mark R., 4,093,450, Cl. 75-0.5AA.

Sherwin-Williams Company, The: *See*—
Jacobs, Richard L., 4,093,509, Cl. 162-158.000.

Sherwood Refractories, Inc.: *See*—
Miller, John J., Jr.; Eppink, Donald L.; and Loxley, Ted A., 4,093,017, Cl. 164-28.000.

Shiba, Haruo: *See*—
Satou, Takateru; and Shiba, Haruo, 4,093,967, Cl. 360-132.000.

Shibahara, Masashi: *See*—
Yamashita, Shigeru; Masaki, Kazuo; and Shibahara, Masashi, 4,093,820, Cl. 179-1.00J.

Shields, James E., to Eli Lilly and Company. Somatostatin analogs and intermediates thereto. 4,093,574, Cl. 260-8.000.

Shiga, Masashi: *See*—
Iga, Yoshiro; and Shiga, Masashi, 4,093,608, Cl. 260-112.00B.

Shigyo, Genshichi: *See*—
Kurohiji, Sinichi; Shigyo, Genshichi; and Arai, Nobujiro, 4,092,942, Cl. 114-222.000.

Shimizu, Naoki: *See*—
Tsuruta, Hidemasa; Itoh, Shoji; Otsuka, Masayuki; and Shimizu, Naoki, 4,093,505, Cl. 159-9.00A.

Shimoi, Akio: *See*—
Kawamura, Yoshikazu; Shimoi, Akio; and Iwai, Yuichiro, 4,093,992, Cl. 364-705.000.

Shimokawa, Wataru: *See*—
Murakami, Saburo, 4,092,873, Cl. 74-82.000.

Shimoura, Akira: *See*—
Ono, Junichi; Shimoura, Akira; and Tanaka, Yukiyasu, 4,092,969, Cl. 123-191.00S.

Shiotari, Yoshihisa: *See*—
Suzuki, Yasoji; Kaneko, Yoshio; and Shiotari, Yoshihisa, 4,093,942, Cl. 340-166.00R.

Shiraga, Ken: *See*—
Tanabe, Yasuo; Toriya, Jun; Sato, Masato; and Shiraga, Ken, 4,093,633, Cl. 260-346.110.

Shiraishi, Takeichi: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shiraishi, Takeichi; Matsuura, Kazuo; and Miyoshi, Mituji, 4,093,789, Cl. 526-114.000.

Shirey, Robert D., to Emerson Electric Co. Resistors with heat sink. 4,093,968, Cl. 361-58.000.

Shiro, Sonobe, to Sansho Co., Ltd. Timepiece having display cylinders. 4,092,823, Cl. 58-125.00C.

Shmelev, Anatoly Nikolaevich: *See*—
Iljunin, Vladimir Grigorievich; Kuznetsov, Igor Alexeevich; Murogov, Viktor Mikhailovich; and Shmelev, Anatoly Nikolaevich, 4,093,514, Cl. 176-65.000.

Shogren, David K.: *See*—
Zucker, Edwin; Shogren, David K.; and Redden, David N., 4,093,374, Cl. 355-57.000.

Shook, Norma G.: *See*—
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,093,048, Cl. 192-13.00R.

Shroff, Bansi K.; Dekker, Frank; and Nordrehaug, John, to Honeywell Inc. Cartridge tape recorder system and cartridge therefor. 4,093,149, Cl. 242-198.000.

Sianesi, Enrico; Bonola, Giuseppe; Setnikar, Ivo; and Magistretti, Maria Jose, to Recordati S.A. Chemical and Pharmaceutical Company. Therapeutically active benzoic acid derivatives and a process for preparing them. 4,093,648, Cl. 260-519.000.

Sidwell, Robert W.: *See*—
Tolman, Richard L.; Sidwell, Robert W.; and Revankar, Ganapathi R., 4,093,714, Cl. 424-180.000.

Sie, Inc.: *See*—
Brown, Lee Roy; and Davison, Thomas M., 4,093,955, Cl. 354-3.000.

Siegler, Manfred; and Wong, Ted Lee, to General Electric Company. Gas separation system. 4,093,429, Cl. 55-58.000.

Siemens Aktiengesellschaft: *See*—
Bromer, Gunter, 4,092,887, Cl. 83-56.000.
Dietze, Wolfgang; Mittermeier, Richard; and Steinwagner, Gerhard, 4,093,201, Cl. 269-296.000.
Hahn, Alfred; Steiner, Ernst; and Pospischil, Rudolf, 4,093,864, Cl. 250-505.000.
Koller, Konrad; and Lauther, Ulrich, 4,093,990, Cl. 364-520.000.
Schneider, Peter; and Goettler, Ernst, 4,094,009, Cl. 365-183.000.

Silberman, Robert L. Single line telephone hold circuit. 4,093,829, Cl. 179-81.00R.

Sillars, Frederick Stirling, to USM Corporation. Seam soldering mechanism. 4,093,113, Cl. 228-36.000.

Silverberg, Morton: *See*—
Eichorn, Roger H., deceased; Lincoln First Bank of Rochester, executor; and Silverberg, Morton, 4,093,367, Cl. 355-3.00R.

Simich, Emil, to A. J. Gerrard & Company. Press platen wedges. 4,092,912, Cl. 100-3.000.

Simier, Jean Noel: *See*—
Ford, Hugh; Mraz, George J.; and Simier, Jean Noel, 4,093,100, Cl. 220-3.000.

Simko, Paul S., to Bunker Ramo Corporation. Power connector. 4,093,332, Cl. 339-49.00R.

Simo, Miroslav Andrew, to New Archery Products Corp. Arrowhead. 4,093,230, Cl. 273-106.50B.

Simon, Lawrence H.: *See*—
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.

Simons, Courtney S.: *See*—
Blanco, Jorge L.; Crnojevich, Ranko P.; and Simons, Courtney S., 4,093,526, Cl. 204-104.000.

Simpson, Walter E.: *See*—
Foord, Stanley G.; and Simpson, Walter E., 4,093,342, Cl. 350-96.230.

Sinai Hospital of Detroit: *See*—
Kantrowitz, Adrian; and Freed, Paul S., 4,092,742, Cl. 3-1.700.

Sincerbox, Glenn Tavernia: *See*—
Shattuck, Meredith David; and Sincerbox, Glenn Tavernia, 4,093,358, Cl. 350-357.000.

Sinclair, William Robert: *See*—
Logan, Ralph Andre; Reinhart, Franz Karl; and Sinclair, William Robert, 4,093,345, Cl. 350-355.000.

Singer Company, The: *See*—
Coughenour, Donald Jay; and Herr, John Addison, 4,092,938, Cl. 112-158.00E.
Knowles, Warren Dean, 4,092,939, Cl. 112-254.000.
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,092,937, Cl. 112-121.110.
Mindell, Marvin I., 4,093,142, Cl. 242-71.100.

Sinn, Hartmut; Schroder, Dieter; and Stallmann, Hans, to Heraeus Christ GmbH. Centrifuge, particularly for use with automatic analysis apparatus, especially for chemical, biological, or medical use. 4,093,118, Cl. 233-26.000.

Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd.: *See*—
Tryhorn, Donald Wilfred, 4,092,957, Cl. 123-48.00B.

Sjogren, Borje Lennart, to AB Wicanders Korkfabriker. Method of and apparatus for feeding articles. 4,093,062, Cl. 198-380.000.

Skatsche, Othmar: *See*—
List, Hans; Skatsche, Othmar; Greier, Josef; Obermayer, Bertram; Feichtinger, Gerhard; and Wagner, Johann, 4,092,956, Cl. 123-41.740.

SKF Kugellagerfabriken GmbH: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,093,053, Cl. 192-98.000.

Skilling, Derek: *See*—
Davis, John Brian; Skilling, Derek; and Wrigley, Nigel Edwin, 4,093,412, Cl. 425-71.000.

Skornschek, Thomas E.: *See*—
Hughes, Thomas E.; and Skornschek, Thomas E., 4,093,211, Cl. 272-68.000.

Slater, Robert Anthony: *See*—
Roe, Anthony Maitland; Slater, Robert Anthony; and Taylor, Edwin Michael, 4,093,725, Cl. 424-250.000.

Slivenko, Victor, to General Atomic Company. Blood access device. 4,092,983, Cl. 128-214.00R.

Sluyters, Theodorus J: *See*—
Kobayashi, Maasaki; Prelec, Krsto; and Sluyters, Theodorus J, 4,093,858, Cl. 250-424.000.

Smalley, Ned J.; and Whitney, Ralph H., to Owens-Illinois, Inc. Home canning system. 4,093,094, Cl. 215-276.000.

Smetana, Andrew: *See*—
Kewley, Norman E.; and Smetana, Andrew, 4,093,979, Cl. 362-5.000.

Smith, Dudley C.: *See*—
Blackburn, James R.; and Smith, Dudley C., 4,093,055, Cl. 192-116.500.

Smith, Garland Y.; and Scott, Gerald R., to Garland Smith Engineering Co., Inc. Tapping machine. 4,093,393, Cl. 408-67.000.

Smith, Gary L.: *See*—
Fitzpatrick, John D.; and Smith, Gary L., 4,093,273, Cl. 280-696.000.

Smith, George W.: *See*—
Kaplit, Michael; Hayden, Daniel B.; and Smith, George W., 4,093,355, Cl. 350-334.000.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas Henry; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,093,621, Cl. 260-294.80H.
Durant, Graham John; Ganellin, Charon Robin; and Owen, Geoffrey Robert, 4,093,729, Cl. 424-270.000.
Roe, Anthony Maitland; Slater, Robert Anthony; and Taylor, Edwin Michael, 4,093,725, Cl. 424-250.000.

Smith, Mervin L., to American Air Filter Company, Inc. Damper assembly for mobile bed scrubber. 4,093,433, Cl. 55-226.000.

Smith, Philip A., to B. F. Goodrich Company, The. Caliper type disc brake. 4,093,043, Cl. 188-73.600.

Smith, Stephen Richard: *See*—
McGrail, Patrick Terence; Smith, Stephen Richard; Bannister, Frederick Robert; and Boutle, David Leonard, 4,093,458, Cl. 96-87.00R.

Smith, Steven R.; and Rose, Frederick A., to Norland Corporation. Random access memory apparatus for a waveform measuring apparatus. 4,093,995, Cl. 364-900.000.

Smith, Trevor James: *See*—
Bamfield, Peter; Quan, Peter Michael; and Smith, Trevor James, 4,093,646, Cl. 260-508.000.

SmithKline Corporation: *See*—
Berges, David A., 4,093,723, Cl. 424-246.000.
Hill, David Taylor, 4,093,719, Cl. 424-215.000.

Perchonock, Carl David, 4,093,807, Cl. 544-183.000.
Smolderen, Albert Emiel, to AGFA-GEVAERT N.V. Package for a stack of sheet materials. 4,093,069, Cl. 206-455.000.
Smrt, Thomas J., to Fox Valley Marking Systems, Inc. Packing sheet and packages formed thereby. 4,093,068, Cl. 206-443.000.
Snizek, Heinz Werner. Air deflector. 4,093,300, Cl. 296-1.00S.
Societe Anonyme dite: Arts et Techniques Nouvelles: *See*—
Augros, Jacques Julien, 4,093,096, Cl. 215-330.000.
Societe Chimique des Charbonnages-CDF Chimie: *See*—
Ford, Hugh; Mraz, George J.; and Simier, Jean Noel, 4,093,100, Cl. 220-3.000.
Societe de Transformation du Caoutchouc-Sotrac: *See*—
Piraud, Jean-Daniel, 4,093,219, Cl. 273-65.00B.
Societe Francaise des Echafaudages Self-Lock: *See*—
Loewe, Henri, 4,092,760, Cl. 16-35.00R.
Societe Lannionnaise d'Electronique SLE-Citerel S. A.: *See*—
Baudin, Jacques, 4,093,828, Cl. 179-18.0FC.
Societe Nouvelle de Bouchons Plastiques S.N.B.P.: *See*—
Babiol, Pierre, 4,093,095, Cl. 215-307.000.
Societe Nouvelle de Roulements: *See*—
Troccaz, Roger, 4,093,325, Cl. 308-192.000.
Soehngen, John W.; and Gerken, Albert, to Celanese Corporation. Apparatus for preparation of matrices containing frangible particulate matter. 4,093,404, Cl. 417-317.000.
Sogemaric: *See*—
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, 4,093,440, Cl. 71-65.000.
Sohar, Paul: *See*—
Schoenewaldt, Erwin F.; and Sohar, Paul, 4,093,657, Cl. 260-567.60M.
Sohl, Gordon, to Xerox Corporation. Character slug construction. 4,093,059, Cl. 400-144.200.
Sokol, Iosif Borisovich; Katysheva, Nina Vladimirovna; Belyaev, Vladimir Mikhailovich; Logvinenko, Dmitry Danilovich; Morozko, Ekaterina Alexandrovna; Pepelin, Boris Alexeevich; and Prudovoi, Viktor Alexeevich. Apparatus for continuous preparation of a suspension. 4,093,189, Cl. 259-7.000.
Sokolov, Sergei Vasilievich: *See*—
Belous, Viktor Mikhailovich; Yagupolsky, Lev Moiseevich; Alexeeva, Ljubov Antonovna; Sokolov, Sergei Vasilievich; and Ponomarev, Alexei Ivanovich, 4,093,665, Cl. 260-612.00D.
Sonerud, John Teodor. Floatable apparatus for excavating and transporting excavated material. 4,092,790, Cl. 37-71.000.
Sony Corporation: *See*—
Makino, Yoshimi; Uedaira, Satoru; and Ito, Shigeyasu, 4,093,453, Cl. 75-129.000.
Sorkin, Charles S.: *See*—
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.
Southwire Company: *See*—
Loest, Kent W.; and Kesler, George H., 4,093,700, Cl. 423-120.000.
Spaan, Jozef Augustinus Elisabeth: *See*—
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Sparton Corporation: *See*—
Crane, Robert H., 4,093,064, Cl. 198-485.000.
Special Metals Corporation: *See*—
Boesch, William J., 4,093,476, Cl. 148-32.500.
Speed-Line Manufacturing Company, Inc.: *See*—
Harley, Alfred H., 4,093,683, Cl. 264-25.000.
Spence-Bate, Harry A. H. Microfiche camera editing device. 4,093,373, Cl. 355-54.000.
Spenceley, Gene Donald; and Pigott, Neil, to British Steel Corporation. Refining liquid metal. 4,093,452, Cl. 75-53.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., to Swiss Aluminium Ltd. Method for preparing aluminum alloys possessing improved resistance weldability. 4,093,474, Cl. 148-2.000.
Sperry Rand Corporation: *See*—
DeCoene, Frans J. G. C., 4,093,087, Cl. 214-83.260.
Thomas, Ronald E., 4,093,903, Cl. 318-584.000.
Spiegelglaswerke Germania, Zweigniederlassung der Glaceries de Saint.Roch S.A.: *See*—
Klaus, Karl-Heinz, 4,093,083, Cl. 214-7.000.
Spivack, John D., to Ciba-Geigy Corporation. Trisubstituted hydroxyphenylalkanoic acid ester and amide stabilized compositions. 4,093,587, Cl. 260-45.8NE.
Spivack, John D.; and Dexter, Martin, to Ciba-Geigy Corporation. Hindered phenolic cyclic phosphonates and stabilized compositions. 4,093,588, Cl. 260-45.80R.
Spivack, John D.; and Dexter, Martin, to Ciba-Geigy Corporation. Amides of 2,4,6-trialkyl-3-hydroxy-phenylalkanoic acids. 4,093,618, Cl. 544-387.000.
Spooner, James E. Rectangular container for the aging of alcoholic beverages. 4,093,099, Cl. 217-72.000.
Spray, Claude. Support for hand grease gun. 4,093,170, Cl. 248-359.000.
Sprunck, Emile; and Leroy, Pierre Jean, to Creusot-Loire. Process for the protection of a refractory wall in service. 4,093,190, Cl. 266-47.000.
Staal, Gerardus B.: *See*—
Henrick, Clive A.; and Staal, Gerardus B., 4,093,622, Cl. 260-295.00R.
Stacy, Carl J.: *See*—
Kraus, Gerard; Stacy, Carl J.; and Cheng, Paul J., 4,093,705, Cl. 423-450.000.
Stahl, Edward L., to Pinckney Molded Plastics, Inc. Stacking and nesting container. 4,093,070, Cl. 206-507.000.
Stahl, Edward L.; and Sanders, Ellsworth E., to Pinckney Molded Plastics, Inc. Nesting and stacking container. 4,093,071, Cl. 206-507.000.
Stahl, Kurt-Wilhelm; and Schuppe, Ekkehard, to Riedel-de Haen Aktiengesellschaft. Column for high pressure liquid chromatography. 4,093,550, Cl. 210-198.00C.
Stallmann, Hans: *See*—
Sinn, Hartmut; Schroder, Dieter; and Stallmann, Hans, 4,093,118, Cl. 233-26.000.
Stalter, Robert J.: *See*—
Burkholder, Theodore B.; and Stalter, Robert J., 4,092,751, Cl. 5-345.00R.
Stamicarbon, B.V.: *See*—
Boesten, Wilhelmus H. J., 4,093,653, Cl. 260-558.00A.
Standard Changemakers, Inc.: *See*—
Bayne, Robert T., 4,092,990, Cl. 133-1.00R.
Standard Oil Company, The: *See*—
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,093,635, Cl. 260-346.750.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,093,558, Cl. 252-432.000.
Standard Oil Company (Indiana): *See*—
Grayson, John F.; and Groth, Peter K. H., 4,093,420, Cl. 23-230.0EP.
Stange, William C., to United States of America, National Aeronautics and Space Administration. Actuator mechanism. 4,092,674, Cl. 74-100.00R.
Stapp, Paul R., to Phillips Petroleum Company. Method for the oxidation of a conjugated diolefin. 4,093,815, Cl. 560-246.000.
Starks, Charles Masterson, to Continental Oil Company. Preparation of 4-n-hexylresorcinol. 4,093,667, Cl. 568-766.000.
Staroste, Joachim; and Heuer, Peter. Sun protection. 4,093,305, Cl. 297-184.000.
Statitrol Corporation: *See*—
Blackwell, Lyman L., 4,093,886, Cl. 313-54.000.
Stauffer Chemical: *See*—
Arneklev, Duane R.; and Baker, Don R., 4,093,445, Cl. 71-100.000.
Stauffer Chemical Company: *See*—
Anderson, Donald F., 4,093,581, Cl. 260-29.6MH.
Honig, Milton L.; Greco, Carl C.; and Walsh, Edward N., 4,093,651, Cl. 260-543.00H.
Jin, Jung Il; and Yu, Arthur J., 4,093,788, Cl. 526-74.000.
Stedman, Robert N., to Caterpillar Tractor Co. Vehicle having resiliently mounted counterweight. 4,093,259, Cl. 280-755.000.
Stein, Eckehard: *See*—
Griesch, Dorothee; Schroter, Herbert; Schwagler, Peter; and Stein, Eckehard, 4,093,375, Cl. 355-68.000.
Steiner, Ernst: *See*—
Hahn, Alfred; Steiner, Ernst; and Pospischil, Rudolf, 4,093,864, Cl. 250-505.000.
Steiner, Marvin Elroy: *See*—
Chu, Bing-Lun; Subbarao, Wunnava Venkata; Peale, Jack; McCune, Kent; and Steiner, Marvin Elroy, 4,093,971, Cl. 361-382.000.
Steinke, Leo: *See*—
Corbach, Rainer; Steinke, Leo; Benedikt, Walter; and Jurinke, Rudolf, 4,093,887, Cl. 313-140.000.
Steinle, Gunter, to Dual Gebruder Steidinger. Loudspeaker protection circuit. 4,093,822, Cl. 179-1.0VL.
Steinwagner, Gerhard: *See*—
Dietze, Wolfgang; Mittermeier, Richard; and Steinwagner, Gerhard, 4,093,201, Cl. 269-296.000.
Steltenkamp, Robert John, to Colgate-Palmolive Company. Flavor and fragrant compositions. 4,093,565, Cl. 252-522.000.
Stenzel, Reiner L., to TRW Inc. Method of and apparatus for the electrostatic excitation of ions. 4,093,856, Cl. 250-293.000.
Stephan, Norbert: *See*—
Uhlmann, Otto; and Stephan, Norbert, 4,092,875, Cl. 72-275.000.
Stephen, John F., to Ciba-Geigy Corporation. Pyrrolidine dicarboxylic acids and esters and stabilized compositions. 4,093,586, Cl. 260-45.80N.
Sterkenburg, Jon L. D.; and Kelbert, George O., to Oil Refining Systems of Florida, Inc. Liquid filter apparatus. 4,093,548, Cl. 210-180.000.
Sterling Drug, Inc.: *See*—
Collins, Joseph C., 4,093,736, Cl. 424-282.000.
Ross, David S., 4,093,544, Cl. 210-59.000.
Sternberg, George P. Preparation of yeast leavened dough products. 4,093,749, Cl. 426-20.000.
Stevens, Robert C.: *See*—
Daly, Lewis J., 4,093,209, Cl. 272-66.000.
Stevenson, Alastair Kershaw: *See*—
Fowler, Albert Lewis; Walker, David Martin; Stevenson, Alastair Kershaw; and Henderson, Alan Graham, 4,092,852, Cl. 73-117.300.
Stevenson, James Santon, to Terminator Products, Inc. Method and apparatus for preparing chemical solutions. 4,092,993, Cl. 137-15.000.
Stewart, Joseph Robert: *See*—
Hogan, Walter John; Schwartz, Alfred Alexander; and Stewart, Joseph Robert, 4,093,996, Cl. 364-900.000.
Stewart, Ralph: *See*—
Hefner, Paul, 4,093,199, Cl. 269-61.000.
Stier, Barry Robert. Diver's buoyant caddy. 4,092,756, Cl. 9-8.00R.

Stimson, Charles Terrance: *See—*
McAllister, John P.; Schroeder, Franklin Theodore; and Stimson, Charles Terrance, 4,093,981, Cl. 364-200.000.
Stoetzer, Richard P.: *See—*
Russell, Walter W.; and Stoetzer, Richard P., 4,093,105, Cl. 220-373.000.
Stokely-Van Camp Inc.: *See—*
Babayan, Vigen K., 4,093,750, Cl. 426-250.000.
Stokic, Bozidar M. Device for determining angle relationships of or between planes. 4,092,779, Cl. 33-1.0SD.
Stork-Werkspoor Diesel B.V.: *See—*
Koskuba, Karel, 4,093,322, Cl. 308-23.000.
Stotz, Wolf-Gunter: *See—*
Link, Christoph; and Stotz, Wolf-Gunter, 4,092,916, Cl. 100-174.000.
Stover, Fred Douglas; and Thatcher, George Carl, to Cooper Industries, Inc. Engine ignition system. 4,092,968, Cl. 123-148.00E.
Strabala, Joseph Lawrence, to James M. Carroll Company. Geared hand wheel for butterfly valves. 4,093,180, Cl. 251-248.000.
Straitz, John F., III, to Combustion Unlimited Incorporated. Fluidic seal. 4,092,908, Cl. 98-60.000.
Stranczek, Norman J., to S&C Electric Company. Protective cover arrangement. 4,093,834, Cl. 200-50.00A.
Strasser, Thomas. Jewelry display rack. 4,093,077, Cl. 211-194.000.
Strobach, Carl G., to Rheem Manufacturing Company. Resistor anode for metal tank. 4,093,529, Cl. 204-197.000.
Strom, Torsten Erik Theodor, to N. Lundbergs Fabriks AB. Nozzle. 4,093,121, Cl. 239-117.000.
Struck, Willi: *See—*
Bahre, Gerhard; Brauns, Jurgen; and Struck, Willi, 4,092,839, Cl. 68-19.000.
Strybel, Richard V., to Gould Inc. Fluid-test apparatus. 4,092,865, Cl. 73-756.000.
Stubenruss, Paul. Multiple valve with automatic sequential operation. 4,092,995, Cl. 137-119.000.
Subbarao, Wunnava Venkata: *See—*
Chu, Bing-Lun; Subbarao, Wunnava Venkata; Peale, Jack; McCune, Kent; and Steiner, Marvin Elroy, 4,093,971, Cl. 361-382.000.
Sugahara, Eisuke, to Nippon Piston Ring Co., Ltd. Piston rod sealing arrangement for a stirling engine. 4,093,239, Cl. 277-3.000.
Sugimoto, Tetsuya: *See—*
Nishikawa, Yasuo; Watanabe, Akira; Sugimoto, Tetsuya; Yabuki, Kazuyasu; and Hatayama, Yoshio, 4,093,561, Cl. 252-466.00J.
Sulzer Brothers, Ltd.: *See—*
deWijn, Joost Robert, 4,093,576, Cl. 260-17.00R.
Summer, Steven E. Digital tachometer. 4,093,916, Cl. 324-166.000.
Sumner, John S. Domical structure. 4,092,810, Cl. 52-81.000.
Sun, Yun Chung, to Dow Chemical Company, The. Process for the recovery of ultrahigh purity indene. 4,093,672, Cl. 260-674.00R.
Sundstrand Corporation: *See—*
Gravelle, Homer E., 4,093,401, Cl. 416-185.000.
Suntech, Inc.: *See—*
van Venrooy, John J., 4,093,647, Cl. 260-515.00R.
Wynkoop, Raymond; Norman, Oscar L.; and Norton, Richard V., 4,093,528, Cl. 204-180.00P.
Suntory Ltd.: *See—*
Katoh, Sadahiko, 4,093,111, Cl. 227-26.000.
Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,093,558, Cl. 252-432.000.
Suslin, Vladimir Isaakovich; Dubovik, Alexandr Ivanovich; Makeev, Boris Anatolievich; Razdymakha, Pavel Semenovich; and Lekarev, Zinovy Abramovich. Device for electrochemical treatment of workpieces. 4,093,530, Cl. 204-224.00M.
Suspa Federungstechnik Fritz Bauer & Sohne OHG: *See—*
Bauer, Fritz, 4,093,196, Cl. 267-65.00R.
Sussman, Edward. Device for holding baby bottles. 4,093,165, Cl. 248-106.000.
Suzuki, Norio: *See—*
Ishiguro, Tatsuo; and Suzuki, Norio, 4,093,962, Cl. 358-138.000.
Suzuki, Tadashi, to Toska Co., Ltd. Binding strap made of synthetic resin. 4,093,288, Cl. 292-321.000.
Suzuki, Yasoji; Kaneko, Yoshio; and Shiotari, Yoshihisa, to Tokyo Shibaura Electric Co., Ltd. Matrix circuits. 4,093,942, Cl. 340-166.00R.
Svec, Frantisek: *See—*
Kalal, Jaroslav; Zurkova, Eva; and Svec, Frantisek, 4,093,602, Cl. 260-73.00R.
Svensson, Lars-Erik; Tengzelius, Jan Robert; and Lindskog, Per Folke, to Hoganas AB, Fack. Phosphorus steel powder and a method of manufacturing the same. 4,093,449, Cl. 75-0.50R.
Svensson, Sven-Hakan: *See—*
Gustavsson, Lars G. T.; and Svensson, Sven-Hakan, 4,092,901, Cl. 89-46.000.
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Svoboda, Josef: *See—*
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Weigl, Erwin; and Svoboda, Josef, 4,093,271, Cl. 280-637.000.
Swanson, Mary C.: *See—*
Frank, Donald H.; Jeffries, J. Fred; Swanson, Mary C.; Erb, Thomas L.; and Hall, James D., 4,092,980, Cl. 128-2.00A.
Sweetheart Plastics, Inc.: *See—*
Davis, Paul; and Schneider, David, 4,093,041, Cl. 186-1.00D.
Sweeting, David: *See—*
Clews, David George; and Sweeting, David, 4,093,158, Cl. 244-182.000.
Swiatovy, Edward Stanley, Jr., to General Cable Corporation. Single die co-extrusion apparatus for insulation. 4,093,414, Cl. 425-113.000.
Swisher, Edmund. Accessory heating device for tractors and similar equipment. 4,093,119, Cl. 237-12.30A.
Swiss Aluminium Ltd.: *See—*
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,093,782, Cl. 428-654.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,093,474, Cl. 148-2.000.
Swithenbank, Colin: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,093,446, Cl. 71-109.000.
Swogger, Emery C., to United States of America, Navy. Gas/liquid separator. 4,093,428, Cl. 55-52.000.
Szur, Alex J., to Diamond Shamrock Corporation. Treating a polymeric shape with nonionic fluorochemical surfactants and product therefrom. 4,093,775, Cl. 428-394.000.
T. Y. Lin International: *See—*
Lin, Tung-Yen; and Yang, Yue-Chyou, 4,092,811, Cl. 52-224.000.
Tabet, Jean-Noel: *See—*
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, 4,093,440, Cl. 71-65.000.
Taborsky, Jiri. Biological filter. 4,093,546, Cl. 210-150.000.
Takai, Seizaburo: *See—*
Araki, Eimi; Sakai, Takeo; Takai, Seizaburo; and Komori, Sekiro, 4,093,425, Cl. 44-10.00F.
Takaoka, Tadashi; and Toyota, Eiichi, to Hitachi, Ltd. Train operation control apparatus. 4,093,162, Cl. 246-182.00B.
Takase, Tsuneo, to Tokyo Shibaura Electric Co., Ltd. Electronic timepiece circuit. 4,092,819, Cl. 58-23.00R.
Takeda, Kunihiko: *See—*
Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,093,570, Cl. 260-2.50B.
Takemura, Tooji; Saitoh, Shigeru; and Hamada, Mitsuharu, to Nissan Motor Company Limited. Guide followable and manually steerable vehicle of a transportation system. 4,092,930, Cl. 104-247.000.
Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.
Tamaru, Munetaka: *See—*
Kume, Kazunari; Watanabe, Minoru; Oono, Hideshi; and Tamaru, Munetaka, 4,092,820, Cl. 58-23.00R.
Tamburin, Gino: *See—*
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Tanabe, Yasuo; Toriya, Jun; Sato, Masato; and Shiraga, Ken, to Mitsubishi Chemical Industries Limited. Process for preparing tetrahydrofuran. 4,093,633, Cl. 260-346.110.
Tanaka Instrument Co., Ltd.: *See—*
Inabayashi, Akira; and Watanabe, Jun, 4,093,289, Cl. 292-336.300.
Tanaka, Masaaki: *See—*
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Tanaka Seiki Co., Ltd.: *See—*
Araya, Kenzo; and Hashimoto, Takashi, 4,092,919, Cl. 101-53.000.
Tanaka, Yukiyasu: *See—*
Ono, Junichi; Shimoura, Akira; and Tanaka, Yukiyasu, 4,092,969, Cl. 123-191.00S.
Tanguy, Pierre; and Faivre, Andre. Electrical appliance for making sorbet. 4,092,835, Cl. 62-136.000.
Tanno, Kazuo; Furutani, Yasumasa; Honda, Takashi; and Uenishi, Akira, to Hitachi, Ltd. Hydrogen generating apparatus. 4,093,527, Cl. 204-129.000.
Taplin, John F. Automatic pressure regulator. 4,092,998, Cl. 137-471.000.
Tardy, Maurice, to Bennes Marrel. Control device of a large hydraulic distributor, in particular for public works appliances. 4,093,002, Cl. 137-596.200.
Tarroni, Giuseppe: *See—*
Prodi, Vittorio; Melandri, Carlo; Tarroni, Giuseppe; Formignani, Massimo; De Zaiacomo, Tonino; and Bompane, Gianfranco, 4,092,845, Cl. 73-28.000.
Tarvin, Larry G. Truck ladder. 4,093,257, Cl. 280-166.000.
Tauber, Manfred; and Heuer, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Device for irradiating liquid and pasty substances. 4,093,419, Cl. 21-102.00R.
Taylor, Allen L., to Minnesota Mining and Manufacturing. Thermal gradient temperature sensor. 4,092,862, Cl. 73-362.0CP.
Taylor, Edwin Michael: *See—*
Roe, Anthony Maitland; Slater, Robert Anthony; and Taylor, Edwin Michael, 4,093,725, Cl. 424-250.000.
Taylor, Frank Howard, to Plessey Handel und Investments AG. Guidance systems. 4,093,952, Cl. 343-108.00R.
Taylor Industries, Inc.: *See—*
Taylor, Philip W., 4,093,761, Cl. 428-43.000.

Taylor, Jerry H.; and Turula, Gabriel T., to Burroughs Corporation. Pressure-activated and non-tacky lift-off element and process therefor. 4,093,772, Cl. 428-339.000.
Taylor, Lionel Ivor Alfred: *See—*
Allman, Denis John; and Taylor, Lionel Ivor Alfred, 4,093,107, Cl. 222-23.000.
Taylor, Philip W., to Taylor Industries, Inc. Sheet with breakaway line. 4,093,761, Cl. 428-43.000.
Taylor, William T. Releasable wireline spear. 4,093,294, Cl. 294-86.250.
TDK Electronics Co., Ltd.: *See—*
Satou, Takateru; and Shiba, Haruo, 4,093,967, Cl. 360-132.000.
Tea, Frank C., to American Baler Company, The. Bale tying apparatus. 4,092,913, Cl. 100-24.000.
Teal, Benjiman R. Magnetically operable engine. 4,093,880, Cl. 310-24.000.
Technar, Incorporated: *See—*
Bell, Lon E., 4,092,926, Cl. 102-204.00R.
Tecneco, S.p.A.: *See—*
Piccinini, Carlo; and Conti, Vincenzo, 4,093,541, Cl. 210-40.000.
Teige, Wolfgang; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Process for the dyeing of water-insoluble thermoplastic polymers and polycondensates in the mass. 4,093,585, Cl. 260-40.00P.
Tektronix, Inc.: *See—*
Christie, Alvin Benson; and Correll, Ronald Eugene, 4,093,891, Cl. 315-3.000.
Teldix GmbH: *See—*
Quandt, Gerhard; and Ries, Werner, 4,093,323, Cl. 308-121.000.
Teleflex Incorporated: *See—*
Wood, Robert A. R., 4,092,905, Cl. 91-499.000.
Telefonaktiebolaget L M Ericsson: *See—*
Jacobson, Tord, 4,093,337, Cl. 339-256.00S.
Telegin, Vasily Dmitrievich: *See—*
Vasiliev, Jury Nikolaevich; Petrenko, Andrei Viktorovich; Bagrov, Georgy Nikolaevich; Gordeeva, Galina Nikolaevna; Kazintsev, Timur Isaakovich; Telegin, Vasily Dmitrievich; and Goldfain, Vitaly Naumovich, 4,093,578, Cl. 260-28.00P.
Teletype Corporation: *See—*
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Telex Computer Products, Inc.: *See—*
Urynowicz, James P.; O'Neill, Daniel R.; Jones, Hale M.; and Painter, Alan, 4,093,148, Cl. 242-182.000.
Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Machine frame assemblies for scraper-chain conveyors. 4,093,065, Cl. 198-735.000.
Temtool Pty., Ltd.: *See—*
Williams, Patrick Robert, 4,092,805, Cl. 51-85.0BS.
Tengzelius, Jan Robert: *See—*
Svensson, Lars-Erik; Tengzelius, Jan Robert; and Lindskog, Per Folke, 4,093,449, Cl. 75-0.50R.
Tennison, Marion A.: *See—*
Thompson, Robert B.; Alers, George A.; and Tennison, Marion A., 4,092,868, Cl. 73-638.000.
Tension Structures Co.: *See—*
Huddle, Carl F., 4,092,992, Cl. 135-3.00R.
Teplyakov, Sergei Dmitrievich: *See—*
Lyass, Abram Moiseevich; Zhukovsky, Sergei Semenovich; and Teplyakov, Sergei Dmitrievich, 4,093,467, Cl. 106-38.350.
Terminal Data Corporation: *See—*
Frech, Roger A., 4,093,370, Cl. 355-43.000.
Terminator Products, Inc.: *See—*
Stevenson, James Santon, 4,092,993, Cl. 137-15.000.
Terpening, George I., to Acro Matic, Inc. Finger/arm friction type exercising device. 4,093,210, Cl. 272-67.000.
Terry, Charles D., to Terry Manufacturing Company. Coin operated newspaper vending machine. 4,093,058, Cl. 194-71.000.
Terry Manufacturing Company: *See—*
Terry, Charles D., 4,093,058, Cl. 194-71.000.
Terry, Ruel C., to In Situ Technology, Inc. Methods of fluidized production of coal in situ. 4,093,025, Cl. 166-251.000.
Terry, Ruel C., to In Situ Technology, Inc. Sealing an underground coal deposit for in situ production. 4,093,310, Cl. 299-2.000.
Terry, Stevens M. Slag blower wall box seal. 4,093,242, Cl. 277-58.000.
Terzian, Rouben T.; and Fletchic, Donald K., to Marvin Glass & Associates. Velocipede steering and driving arrangement. 4,093,260, Cl. 280-240.000.
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Ikariishi, Koichi; Kondo, Kanji; and Teshiba, Toko, 4,093,321, Cl. 308-20.000.
Tessandori, Joseph L.: *See—*
Manzonelli, Carmen C.; and Tessandori, Joseph L., 4,093,475, Cl. 148-32.000.
Tessler, Martin M., to National Starch and Chemical Corporation. Method for preparing starch sulfate esters. 4,093,798, Cl. 536-48.000.
Texaco Inc.: *See—*
Lynch, Charles R.; and Wheeler, Robert A., 4,092,847, Cl. 73-36.000.
Mayer, Edward A.; and Sassi, Frank V., 4,092,959, Cl. 123-119.00A.
Texas Instruments Incorporated: *See—*
Buss, Kenneth George, 4,093,921, Cl. 325-459.000.
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Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.
Thatcher, George Carl: *See—*
Stover, Fred Douglas; and Thatcher, George Carl, 4,092,968, Cl. 123-148.00E.
Theeuwes, Felix: *See—*
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,093,708, Cl. 424-15.000.
Thomas, Arthur E.; and Pace, E. Alan, to Envirotech Corporation. Cleaning of textile carding machines including an air recirculating system. 4,092,764, Cl. 19-107.000.
Thomas, David Charles, to Kerr-McGee Chemical Corporation. Method and apparatus for determining hydrocyclone interior wear. 4,092,848, Cl. 73-86.000.
Thomas, Marion E.: *See—*
Shatila, Mounir A.; VonDerLieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,093,125, Cl. 239-553.300.
Thomas, Ronald E., to Sperry Rand Corporation. Apparatus for extending the linear signal range of a rotary transformer type device. 4,093,903, Cl. 318-584.000.
Thompson, Robert B.; Alers, George A.; and Tennison, Marion A., to Rockwell International Corporation. Ultrasonic inspection of pipelines. 4,092,868, Cl. 73-638.000.
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Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,093,827, Cl. 179-15.0AT.
Lamarche, Jean Luc, 4,093,926, Cl. 331-11.000.
Thomson, James E., to Western Stamping Corporation. Toy cash register construction. 4,093,848, Cl. 235-1.00E.
Thwaites, Peter John; and Green, Dennis William, to Dufaylite Developments Limited. Fire-protective cellular service ducting. 4,093,818, Cl. 174-48.000.
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Raybon, Charles L., 4,092,782, Cl. 33-174.00N.
Tinnes, Bernhard; and Ruckstuhl, Franz, to Metacon AG. Process and apparatus for renewing sliding gate valve units for casting ladles. 4,092,771, Cl. 29-401.00F.
Tinney, Francis John, to Parke, David & Company. Octapeptides and methods for their production. 4,093,611, Cl. 260-112.5LH.
Tinyakov, Viktor Gurievich: *See—*
Frantsenjuk, Ivan Vasilievich; Belyansky, Andrei Dmitrievich; Bobylev, Leonid Semenovich; Karetny, Zinovy Petrovich; Alexandrov, Nikolai Nikitievich; Kulikov, Vasily Ivanovich; Kovalevich, Evgeny Vladimirovich; Tinyakov, Viktor Gurievich; Bolotnov, Alexandr Vladimirovich; Chernov, Jury Alexandrovich; Kolesov, Vladimir Mikhailovich; Svetlakov, Nikolai Matveevich; Burmistrov, Gennady Nikolaevich; and Kuxenko, Jury Grigorievich, 4,093,023, Cl. 165-89.000.
Tire Recycling of Minnesota, Inc.: *See—*
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Titeflex, a division of Atlas Corporation: *See—*
Lalikos, James M.; and Waite, Harold K., 4,092,897, Cl. 87-29.000.
Tjornhom, David A., Sr. Electrical adapter. 4,093,333, Cl. 339-78.000.
TMC Corporation: *See—*
Horn, Hans, 4,093,267, Cl. 280-605.000.
Krob, Erwin; and Svoboda, Josef, 4,093,270, Cl. 280-626.000.
Weigl, Erwin; and Svoboda, Josef, 4,093,271, Cl. 280-637.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ono, Masahiko, 4,093,984, Cl. 364-200.000.
Sato, Kazuyuki, 4,093,993, Cl. 364-712.000.
Suzuki, Yasoji; Kaneko, Yoshio; and Shiotari, Yoshihisa, 4,093,942, Cl. 340-166.00R.
Takase, Tsuneo, 4,092,819, Cl. 58-23.00R.
Tolman, Richard L.; Sidwell, Robert W.; and Revankar, Ganapathi R., to ICN Pharmaceuticals, Inc. 9β-D-Arabinofuranosylpurine nucleotides and method of use. 4,093,714, Cl. 424-180.000.
Tomalinas, William R., Jr., to Roth American, Inc. Child's riding toy and stand apparatus. 4,093,208, Cl. 272-52.500.
Tomlinson, Walter John, III: *See—*
Bjorklund, Gary Carl; Mollenauer, Linn Frederick; and Tomlinson, Walter John, III, 4,093,338, Cl. 350-3.700.
Tomoda, Hajime; Mitsuhashi, Kenhachi; and Morikawa, Tuneo, to Yokohama Rubber Co., Ltd., The. Radial ply pneumatic tire having woven multifilament fabric reinforcing ply. 4,093,014, Cl. 152-362.0CS.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,093,712, Cl. 424-177.000.
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Tornell, Lars Johan: *See—*
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Toth, Endre Leslie: *See—*
Fellure, James Erwin; and Toth, Endre Leslie, 4,093,844, Cl. 219-124.020.
Towmotor Corporation: *See—*
Gregg, Edmund; and Melocik, Grant C., 4,093,091, Cl. 214-673.000.
Povejsil, James Harrie, 4,092,876, Cl. 74-478.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Konno, Ryozo; Ikeda, Akira; Ugai, Toshimitsu; and Hirose, Akio, 4,093,577, Cl. 260-22.0CB.
Otsuki, Akira; Naito, Michihisa; Mashimo, Yukifumi; and Ikeda, Akira, 4,093,759, Cl. 428-35.000.
Yoshida, Risaburo; Kaiho, Keisuke; Ide, Yusaku; and Hirose, Takeshi, 4,093,424, Cl. 44-3.00C.
Toyo Kogyo Co., Ltd.: *See—*
Inabayashi, Akira; and Watanabe, Jun, 4,093,289, Cl. 292-336.300.
Toyota, Eiichi: *See—*
Takaoka, Tadashi; and Toyota, Eiichi, 4,093,162, Cl. 246-182.00B.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawamura, Kouji, 4,093,045, Cl. 188-73.500.
Nohira, Hidetaka; and Tanaka, Masaaki, 4,092,960, Cl. 123-119.00A.
Yamada, Minoru, 4,092,961, Cl. 123-119.0EC.
Toyoto Jidosha Kogyo K. K.: *See—*
Ezaki, Toshi, 4,093,254, Cl. 280-783.000.
Tragesser, Charles W.: *See—*
Bohinc, Richard J.; Tragesser, Charles W.; Vaill, Ronald E.; and Racki, Francis R., 4,093,837, Cl. 200-150.00G.
Transputer (Proprietary) Limited: *See—*
Mitchell, Neville Herbert, 4,093,939, Cl. 340-52.00F.
Travagli, Roger Emil: *See—*
Withop, Arthur; and Travagli, Roger Emil, 4,093,688, Cl. 264-65.000.
Travis, James; and Pannell, Ralph, to Research Corporation. Selective removal of albumin from blood fluids and compositions therefore. 4,093,612, Cl. 260-122.000.
Trecker, David John; and Sandner, Michael Ray, to Union Carbide Corporation. Catalytic decarbonylation of esters. 4,093,661, Cl. 260-595.000.
Treiber, Kenneth L. Silencer and cooler for pump unit. 4,093,040, Cl. 181-252.000.
Trembley, William H.: *See—*
Whelpton, Hugh G.; and Trembley, William H., 4,093,491, Cl. 156-309.000.
Trepanier, Donald L.: *See—*
Britton, Thomas C.; and Trepanier, Donald L., 4,093,805, Cl. 544-116.000.
Trethewey, Thomas E.; and Wells, Peter M., Jr., to Ideal Industries, Inc. Electrician's fish tape. 4,092,780, Cl. 33-139.000.
Treuner, Uwe D.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,093,801, Cl. 544-25.000.
Troccaz, Roger, to Societe Nouvelle de Roulements. Tubular spindle mounting for bicycle bottom-bracket hub. 4,093,325, Cl. 308-192.000.
Trozzolo, Anthony Marion: *See—*
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,093,774, Cl. 428-379.000.
Trube, Hans: *See—*
Meyer, Ernst; Trube, Hans; and Grimm, Hermann, 4,092,907, Cl. 98-40.00A.
True Temper Corporation: *See—*
Portz, William E., 4,093,031, Cl. 172-372.000.
Trumbauer, David V., to Deere & Company. Casting methods with composite molded core assembly. 4,093,018, Cl. 164-32.000.
TRW Inc.: *See—*
Stenzel, Reiner L., 4,093,856, Cl. 250-293.000.
Tryhorn, Donald Wilfred, to Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. Compression ignition internal combustion engine. 4,092,957, Cl. 123-48.00B.
Tsuda, Hiroshi, to Olympus Optical Company Limited. Copying machine. 4,093,377, Cl. 355-76.000.
Tsukamoto, Kenkichi. Moving coil cartridge with magnetic means to affix stylus holder to cartridge casing. 4,093,833, Cl. 179-100.41D.
Tsukumo, Zenzaburo, to NTN Toyo Bearing Co. Ltd.; and Tsukumo, Zenzaburo. Bracket tightening device. 4,093,390, Cl. 403-373.000.
Tsuruta, Hidemasa; Itoh, Shoji; Otsuka, Masayuki; and Shimizu, Naoki, to Nittetu Chemical Engineering Ltd. Method and apparatus for heating and removing moisture from watery material. 4,093,505, Cl. 159-9.00A.
Tsutsui, Koichi; and Eguchie, Yoshio, to Nippon Paint Co., Ltd. Powder coating composition. 4,093,674, Cl. 260-830.00P.
Tupker, Willem E.: *See—*
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Turbodyne Corporation (Steam Turbine Division): *See—*
Browning, William W.; and Legacy, Donald J., 4,092,768, Cl. 29-156.80R.
Turcotte, Ronald E.; and Wahl, John S., to Schlumberger Technology Corporation. Well logging sonde including a linear particle accelerator. 4,093,854, Cl. 250-269.000.
Turner, Robert B., to Johnson & Johnson. Electronic thermometer circuit. 4,092,863, Cl. 73-362.0AR.
Turula, Gabriel T.: *See—*
Taylor, Jerry H.; and Turula, Gabriel T., 4,093,772, Cl. 428-339.000.
Tyler Holding Company: *See—*
Hurst, Gerald L., 4,093,478, Cl. 149-2.000.
Tynes, William J., III: *See—*
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., 4,093,849, Cl. 235-92.0PC.
Uchida, Michio: *See—*
Akatsuka, Shin-Ichiro; Akutsu, Shozo; and Uchida, Michio, 4,093,748, Cl. 426-19.000.
Uchida, Tomoaki, to Victor Company of Japan Ltd. Horizontal AFC circuit in a television receiver usable with a video signal recording and reproducing apparatus. 4,093,963, Cl. 358-158.000.
Uedaira, Satoru: *See—*
Makino, Yoshimi; Uedaira, Satoru; and Ito, Shigeyasu, 4,093,453, Cl. 75-129.000.
Uenishi, Akira: *See—*
Tanno, Kazuo; Furutani, Yasumasa; Honda, Takashi; and Uenishi, Akira, 4,093,527, Cl. 204-129.000.
Ueshima, Tadao. Process for treating milk-coffee mixtures in sealed containers to eliminate inconsistency and deterioration in taste. 4,093,751, Cl. 426-407.000.
Ugai, Toshimitsu: *See—*
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Uhlmann, Otto; and Stephan, Norbert, to Marshall Richards Barcro Limited. Tube drawing method and apparatus. 4,092,875, Cl. 72-275.000.
Umsonst, Gerhard: *See—*
Zwahlen, Gunther; Umsonst, Gerhard; and Laely, Andreas, 4,093,584, Cl. 260-40.00P.
Ungar, Israel S.: *See—*
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Union Carbide Corporation: *See—*
Bailey, Frederick Eugene; and von Dohlen, Werner Claus, 4,093,678, Cl. 260-897.00A.
Butwell, Kenneth Francis, 4,093,701, Cl. 423-228.000.
D'Silva, Themistocles D. J., 4,093,652, Cl. 260-544.00C.
Fan, You-Ling; and Farnham, Alford Gailey, 4,093,600, Cl. 260-49.000.
Hagan, Joseph Weldon, 4,093,575, Cl. 260-15.000.
Lindstrom, George Adam; and Holland, Robert Charles, 4,093,843, Cl. 219-121.0EB.
Schilling, Curtis L.; Prokai, Bela; and Kanner, Bernard, 4,093,642, Cl. 544-106.000.
Trecker, David John; and Sandner, Michael Ray, 4,093,661, Cl. 260-595.000.
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Schure, Ralph M.; Kooi, John H.; and Brown, John M., 4,093,675, Cl. 260-835.000.
United Gas Industries Limited: *See—*
McGowan, Eric, 4,092,994, Cl. 137-65.000.
United Kingdom Atomic Energy Authority: *See—*
Lloyd, Albert Ivor, 4,092,834, Cl. 62-123.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Haeussermann, Walter, 4,093,917, Cl. 324-173.000.
Agriculture: *See—*
Carr, Merle E., 4,093,510, Cl. 162-175.000.
Miller, William R.; and Pryde, Everett H., 4,093,637, Cl. 260-405.000.
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Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.
Bernazzani, Richard J., 4,092,973, Cl. 126-37.00B.
Driscoll, Joseph R., 4,093,784, Cl. 429-101.000.
Durenec, Peter, 4,092,829, Cl. 60-517.000.
Durenec, Peter, 4,092,833, Cl. 62-6.000.
Kanda, Richard, 4,092,856, Cl. 73-141.00A.
King, Gerard J.; and Martino, Joseph F., 4,093,957, Cl. 357-24.000.
Lienau, Jeffrey A., 4,092,899, Cl. 89-1.816.
MacNamara, Elizabeth L.; and Pearlstein, Fred, 4,093,566, Cl. 252-527.000.
Ricks, Earl C., 4,092,793, Cl. 42-1.0ST.
Energy: *See—*
Kobayashi, Maasaki; Prelec, Krsto; and Sluyters, Theodorus J, 4,093,858, Cl. 250-424.000.
Marchant, David D.; and Killpatrick, Don H., 4,093,879, Cl. 310-11.000.
Sevec, John B., 4,093,835, Cl. 200-61.45M.
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Goldstein, Howard E.; Leiser, Daniel B.; and Katvala, Victor W. Reaction cured glass and glass coatings. 4,093,771, Cl. 428-312.000.
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Coe, Paul L., Jr., 4,093,156, Cl. 244-45.00A.
Kurtz, Robert L., 4,093,382, Cl. 356-72.000.
Stange, William C., 4,092,874, Cl. 74-100.00R.
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ap Rhys, Tomos L., 4,093,950, Cl. 343-7.700.
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Edgerton, Gene A., 4,092,858, Cl. 73-170.00A.
Ferguson, Gerald D., 4,093,384, Cl. 356-186.000.
Gilligan, William H.; and Kamlet, Mortimer J., 4,093,623, Cl. 260-299.000.

Hitney, Herbert V., 4,093,918, Cl. 325-67.000.
Labrecque, Jean P., 4,092,947, Cl. 116-118.00R.
Proctor, David, 4,093,928, Cl. 333-11.000.
Swogger, Emery C., 4,093,428, Cl. 55-52.000.
Urick, Robert J.; and Parris, Robert L., 4,093,934, Cl. 340-2.000.
White, Matthew B., 4,093,380, Cl. 356-5.000.
Witherspoon, John F., 4,092,898, Cl. 89-1.811.
United States: *See*—
Kolobow, Theodor, 4,093,515, Cl. 195-1.800.
U.S. Philips Corporation: *See*—
Bloem, Jan; and Bouwknegt, Albert, 4,093,889, Cl. 313-229.000.
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, 4,094,013, Cl. 365-234.000.
Jacob, Guy Michel, 4,093,704, Cl. 423-299.000.
Klose, Karl, 4,093,340, Cl. 350-6.500.
Pepperl, Rudiger; Kruger, Johann; and Hill, Bernhard, 4,094,010, Cl. 365-215.000.
Ponjee, Johannes J.; and Feil, Hendrik J., 4,093,504, Cl. 156-656.000.
Verriet, Johannes Gerardus; and Seuter, Antonius Maria, Josephus, Hubertus, 4,093,890, Cl. 313-486.000.
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Murray, John A., 4,093,690, Cl. 264-82.000.
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Cavanagh, Robert B., Jr.; and Jan, David K., 4,093,157, Cl. 244-53.00R.
Rybicki, Robert Charles, 4,093,400, Cl. 416-141.000.
University of Mississippi: *See*—
Hufford, Charles D., 4,093,717, Cl. 424-195.000.
Unterberg, Hartmut, to Girling Limited. Sliding caliper disc brake. 4,093,044, Cl. 188-73.300.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,093,813, Cl. 560-121.000.
Chen, Augustin T.; and Onder, Kemal B., 4,093,604, Cl. 260-77.5CH.
Dougan, Thomas P., 4,092,752, Cl. 5-345.00R.
Nelson, Norman A., 4,093,659, Cl. 260-586.00R.
Urban, Friedrich: *See*—
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Urick, Robert J.; and Parris, Robert L., to United States of America, Navy. Free-falling sonobuoy. 4,093,934, Cl. 340-2.000.
Urynowicz, James P.; O'Neill, Daniel R.; Jones, Hale M.; and Painter, Alan, to Telex Computer Products, Inc. Tape path for a magnetic tape transport system. 4,093,148, Cl. 242-182.000.
USM Corporation: *See*—
Meyer, Engelbert A., 4,092,766, Cl. 24-73.0MF.
Sillars, Frederick Stirling, 4,093,113, Cl. 228-36.000.
Uyama, Noboru; and Hara, Katsuaki, to Kubota Ltd. Electronic weighing apparatus. 4,093,032, Cl. 177-165.000.
v. Asseldonk, Antonius Gerardus Martinus: *See*—
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Vaagenes, Ronald. Illuminated costume jewelry. 4,093,973, Cl. 362-104.000.
Vaill, Ronald E.: *See*—
Bohinc, Richard J.; Tragesser, Charles W.; Vaill, Ronald E.; and Racki, Francis R., 4,093,837, Cl. 200-150.00G.
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Schelkmann, Wilhelm, 4,093,481, Cl. 156-95.000.
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Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., to Philip Morris Incorporated. Smoking tobacco compositions. 4,092,988, Cl. 131-17.00R.
Vanderplaats, Norman R., to Varian Associates, Inc. Ring-and-bar slow wave circuits employing ceramic supports at the bars. 4,093,892, Cl. 315-3.500.
Van der Wal, Siemen, to Verenigde Bedrijven Bredero N.V. Underwater anchor for the mooring of floating structures as well as a method for the placing of such an anchor. 4,092,944, Cl. 114-297.000.
Vandevyver, Michel: *See*—
Barraud, Andre; Gras, Roger; and Vandevyver, Michel, 4,093,757, Cl. 427-434.00A.
Van Holten, Theodoor. Propeller or a set of wings for a wind mill. 4,093,402, Cl. 416-236.00A.
Vannice, M. Albert; and Garten, Robert L., to Exxon Research and Engineering Company. Catalytic formation of hydrocarbons from CO, H_2 mixtures and process for maintaining catalytic activity. 4,093,643, Cl. 260-449.00M.
Vannier, Jerald W.; and Bastian, Gary T., to Intel Corporation. Compensating digital counter for quartz crystal oscillator. 4,093,873, Cl. 307-223.00R.
Van Rens, Russel J.: *See*—
Schrimpf, Carl F.; and Van Rens, Russel J., 4,093,403, Cl. 417-246.000.
van Staveren, Dirk Adriaan, to N. V. Technische Maatschappij Marchand-Andriessen. Frictional heat weld. 4,093,501, Cl. 156-580.000.
van Venrooy, John J., to Suntech, Inc. Process for oxycarbonylation of aromatic hydrocarbons. 4,093,647, Cl. 260-515.00R.
Varian Associates, Inc.: *See*—
Hill, Howard D. W., 4,093,910, Cl. 324-0.5AH.
Hill, Howard D. W.; and Laudermilch, John R., 4,093,911, Cl. 324-.5AH.
O'Neal, Charles D., III, 4,093,913, Cl. 324-33.000.
Vanderplaats, Norman R., 4,093,892, Cl. 315-3.500.
Vasiliev, Jury Nikolaevich; Petrenko, Andrei Viktorovich; Bagrov, Georgy Nikolaevich; Gordeeva, Galina Nikolaevna; Kazintsev, Timur Isaakovich; Telegin, Vasily Dmitrievich; and Goldfain, Vitaly Naumovich. Self-lubricating antifriction material. 4,093,578, Cl. 260-28.00P.
Vasninova-Shipulina, Iya Petrovna: *See*—
Eliseev, Stanislav Borisovich; Butskoi, Jury Alexandrovich; Dmitrievsky, Vladimir Sergeevich; Golubeva, Albina Andreevna; Ozerov, Vladimir Mikhailovich; Volkov, Valentin Stepanovich; and Vasninova-Shipulina, Iya Petrovna, 4,093,448, Cl. 75-3.000.
VEB Kombinat Zentronik: *See*—
Muntschick, Peter, 4,093,060, Cl. 400-236.100.
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Bachmann, Lothar Willy; and Reise, Eberhardt Karl, 4,093,391, Cl. 407-22.000.
Veeneman, John L.: *See*—
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Velsicol Chemical Corporation: *See*—
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Vennett, Richard M.: *See*—
Oertle, Donald H.; Vennett, Richard M.; Casad, Burton M.; and Radd, Fred J., 4,092,844, Cl. 73-23.000.
Verdesca, Anthony Fredrick; and Borrajo, Orlando, to Fib-R-Fit Inc. Quick connect-disconnect pipe coupling. 4,093,279, Cl. 285-23.000.
Vereinigte Flugtechnische Werke-Fokker GmbH: *See*—
Friedrich, Helmut, 4,092,824, Cl. 60-39.020.
Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,093,192, Cl. 266-78.000.
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Van der Wal, Siemen, 4,092,944, Cl. 114-297.000.
Verriet, Johannes Gerardus; and Seuter, Antonius Maria, Josephus, Hubertus, to U.S. Philips Corporation. Terbium-activated luminescent garnet material and mercury vapor discharge lamp containing the same. 4,093,890, Cl. 313-486.000.
Veteo Offshore Industries, Inc.: *See*—
Jansen, Martin B., Jr., 4,093,281, Cl. 285-39.000.
Vial, Jean: *See*—
Clapot, Claude; Vial, Jean; and Dumont, Louis, 4,093,444, Cl. 71-92.000.
Vickers Limited: *See*—
Fuller, Paul; Gillender, John Brian; Shacklady, Michael; and Basu, Samir, 4,093,999, Cl. 364-900.000.
Victor Company of Japan Ltd.: *See*—
Uchida, Tomoaki, 4,093,963, Cl. 358-158.000.
Vinals, Joaquin Francisco: *See*—
Withycombe, Donald Arthur; Mookherjee, Braja Dulal; Vock, Manfred Hugo; and Vinals, Joaquin Francisco, 4,093,752, Cl. 426-536.000.
Viscount, Kenneth W. Self-contained, multi-blade package for slurry saws and the like. 4,092,971, Cl. 125-16.00R.
Viva-Tech Inc.: *See*—
Evans, William C., 4,093,908, Cl. 323-19.000.
Vock, Manfred Hugo: *See*—
Withycombe, Donald Arthur; Mookherjee, Braja Dulal; Vock, Manfred Hugo; and Vinals, Joaquin Francisco, 4,093,752, Cl. 426-536.000.
Volgenau, Lewis: *See*—
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,093,580, Cl. 260-29.6SQ.
Volkov, Valentin Stepanovich: *See*—
Eliseev, Stanislav Borisovich; Butskoi, Jury Alexandrovich; Dmitrievsky, Vladimir Sergeevich; Golubeva, Albina Andreevna; Ozerov, Vladimir Mikhailovich; Volkov, Valentin Stepanovich; and Vasninova-Shipulina, Iya Petrovna, 4,093,448, Cl. 75-3.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Neumann, Joachim, 4,093,423, Cl. 23-288.0FC.
von Braun, Leopold, to Teletype Corporation. Stepping motor using extended drive pulses. 4,093,905, Cl. 318-696.000.
VonDerLieth, William H.: *See*—
Shatila, Mounir A.; VonDerLieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,093,125, Cl. 239-553.300.
von Dohlen, Werner Claus: *See*—
Bailey, Frederick Eugene; and von Dohlen, Werner Claus, 4,093,678, Cl. 260-897.00A.
Vonk, Gottfried: *See*—
Davis, Gregory A.; Krippner, Kenneth E.; Roestel, Jan A.; Vonk, Gottfried; and Zacher, Albert R., Jr., 4,093,859, Cl. 250-445.00T.
Vorhees, Charles. Frame assembly for signs. 4,092,792, Cl. 40-607.000.
Vortac, Inc.: *See*—
Prosen, Gildo, 4,092,966, Cl. 123-141.000.
Vortex Design Ltd.: *See*—
Pappas, Jeffrey, 4,093,830, Cl. 179-99.000.
Voyles, Gerald A., to P. R. Mallory & Co. Inc. Anode termination means for an electrical device component. 4,093,972, Cl. 361-433.000.
Vredevoogd, Jon D.: *See*—
Huddle, Carl F., 4,092,992, Cl. 135-3.00R.
Vrooman, Richard A. Vaporizer-regulator, liquid fuel. 4,092,963, Cl. 123-133.000.
W. R. Grace & Co.: *See*—
Wszolek, Walter Robert, 4,093,097, Cl. 215-349.000.
Wszolek, Walter Robert, 4,093,098, Cl. 215-349.000.

WABCO Westinghouse GmbH: *See*—
Lindemann, Klaus; Weise, Lutz; and Reinecke, Erich, 4,093,317, Cl. 303-111.000.
Reinecke, Erich, 4,093,316, Cl. 303-100.000.

Wachendorf, Friedrich: *See*—
Hoffmann, Herbert; and Wachendorf, Friedrich, 4,093,133, Cl. 242-18.0PW.

Wacker-Chemie GmbH: *See*—
Bauer, Johann; and Heckmaier, Joseph, 4,093,791, Cl. 526-200.000.

Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Triazoloisoindoles. 4,093,728, Cl. 424-269.000.

Wagener, Earl H.: *See*—
Harris, Robert F.; and Wagener, Earl H., 4,093,663, Cl. 260-607.00B.

Wagner, Johann: *See*—
List, Hans; Skatsche, Othmar; Greier, Josef; Obermayer, Bertram; Feichtinger, Gerhard; and Wagner, Johann, 4,092,956, Cl. 123-41.740.

Wahl, John S.: *See*—
Turcotte, Ronald E.; and Wahl, John S., 4,093,854, Cl. 250-269.000.

Waite, Harold K.: *See*—
Lalikos, James M.; and Waite, Harold K., 4,092,897, Cl. 87-29.000.

Walker, David Martin: *See*—
Fowler, Albert Lewis; Walker, David Martin; Stevenson, Alastair Kershaw; and Henderson, Alan Graham, 4,092,852, Cl. 73-117.300.

Walker, John A.; and Dimitri, Dimitri S., to Datametrics Corporation. Temperature control system for electric fluid heater. 4,093,847, Cl. 219-501.000.

Walkowiak, Michael: *See*—
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,093,722, Cl. 424-246.000.

Walsh, Edward N.: *See*—
Honig, Milton L.; Greco, Carl C.; and Walsh, Edward N., 4,093,651, Cl. 260-543.00H.

Walter G. Finch: *See*—
McLean, William B., 4,093,154, Cl. 244-3.160.

Walter, Lothar: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,093,053, Cl. 192-98.000.

Wampfler, Manfred. Travelling cable support system. 4,093,047, Cl. 191-12.00R.

Ward, David C.: *See*—
Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., 4,093,715, Cl. 424-180.000.
Lin, Tai-Shun; Prusoff, H. William; and Ward, David C., 4,093,716, Cl. 424-180.000.

Warne Surgical Products Limited: *See*—
Harrison, Reginald William; and Peach, George Albert, 4,093,484, Cl. 156-244.130.

Watanabe, Akira: *See*—
Nishikawa, Yasuo; Watanabe, Akira; Sugimoto, Tetsuya; Yabuki, Kazuyasu; and Hatayama, Yoshio, 4,093,561, Cl. 252-466.00J.

Watanabe, Hiroshi, to Nippon Electric Co., Ltd. Carrier converter comprising a variable impedance circuit pair or at least one balanced diode bridge. 4,093,919, Cl. 325-316.000.

Watanabe, Itaru: *See*—
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; and Yokoyama, Shigeo, 4,093,568, Cl. 260-2.20R.

Watanabe, Jun: *See*—
Inabayashi, Akira; and Watanabe, Jun, 4,093,289, Cl. 292-336.300.

Watanabe, Kazuo: *See*—
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Watanabe, Minoru: *See*—
Kume, Kazunari; Watanabe, Minoru; Oono, Hideshi; and Tamaru, Munetaka, 4,092,820, Cl. 58-23.00R.

Watkins, Richard Kenneth; and Benatar, Leo, to Mead Corporation, The. Panel interlocking means. 4,093,116, Cl. 229-40.000.

Watrous, Donald L.; and Dobberphul, Daniel W., to General Electric Company. Method and apparatus for operating a semiconductor integrated circuit at minimum power requirements. 4,093,909, Cl. 323-22.00R.

Watson, Kenneth; and Saunders, James Edwin, to Westland Aircraft Limited. Freewheel devices. 4,093,049, Cl. 192-47.000.

Watson, Roy E.: *See*—
Miele, Raymond D., Jr.; and Watson, Roy E., 4,092,866, Cl. 73-431.000.

Watts, Homer. Plastic tube cutter. 4,092,774, Cl. 30-92.000.

Waugh, Robert E., to D. L. Auld Company, The. Apparatus for coating glass containers. 4,092,953, Cl. 118-642.000.

Wayland, James Robert, Jr.; Davis, Frank S.; and Merkle, Morris Guy, to Phytox Corporation. Vegetation control. 4,092,800, Cl. 47-1.300.

Wehrmann, Felix: *See*—
Kirsch, Kurt; Hilzensauer, Volkmar; Pflug, Gunther; Wehrmann, Felix; and Maresch, Gerald, 4,093,488, Cl. 156-245.000.

Weigele, Gebhard. Counting mechanism for a motor vehicle washing plant. 4,092,759, Cl. 15-257.000.

Weigl, Erwin; and Svoboda, Josef, to TMC Corporation. Buckle for safety strap for skis. 4,093,271, Cl. 280-637.000.

Weiner, Manfred, to Ehrenreich Photo-Optical Industries, Inc. Method and apparatus for making photographic copies. 4,093,379, Cl. 355-77.000.

Weinhold, Karl. Device for releasably fastening tube or pipe ends. 4,093,283, Cl. 285-243.000.

Weinstein, Leonard M. Contrast enhancement and small detail blending of photographic images. 4,093,460, Cl. 96-27.00E.

Weipert, Eugene A.; and Deck, Charles F., to BASF Wyandotte Corporation. Antistatic agents for melt-formed polymers. 4,093,676, Cl. 260-857.0PG.

Weise, Lutz: *See*—
Lindemann, Klaus; Weise, Lutz; and Reinecke, Erich, 4,093,317, Cl. 303-111.000.

Weiss, Gary Douglas. Chess board game. 4,093,237, Cl. 273-260.000.

Weissert, Helmut: *See*—
Hausberg, Gerhard; Hegemann, Karl-Rudolf; Finger, Gunther; Schafer, Hans; and Weissert, Helmut, 4,093,434, Cl. 55-226.000.

Weisz, Paul Burg; and Zahner, John Clarence, to Mobil Oil Corporation. Utilization of low BTU natural gas. 4,093,029, Cl. 166-305.00R.

Welch, Richard D.; and Iversen, John E., to Eastman Kodak Company. Apparatus for forming a photographic pod-tape product. 4,093,493, Cl. 156-358.000.

Wells, Peter M., Jr.: *See*—
Trethewey, Thomas E.; and Wells, Peter M., Jr., 4,092,780, Cl. 33-139.000.

Wendell, David. Automatic shirt collar stay applying machine. 4,093,498, Cl. 156-494.000.

Wenzel, Werner, to NUSTEP Trenndusen Entwicklungsund Patentverwertungsgesellschaft mbH & Co. Kommanditgesellschaft. Uranium enrichment apparatus having a cascade of separating stages in a single unit. 4,093,436, Cl. 55-269.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Hottinger, Conrad; Ruppen, Bruno; and Schaffner, Kurt, 4,092,900, Cl. 89-33.00B.

Wertelewski, Wilhelm: *See*—
Lubojatsky, Walter; and Wertelewski, Wilhelm, 4,092,831, Cl. 61-45.00D.

Weskamp, Robert J.; and Barclay, Robert H., to Industrial Park Machine & Tool Co, Inc. Artificial Christmas tree with foldable branching and method of making same. 4,093,758, Cl. 428-8.000.

West Laboratories, Inc.: *See*—
Winicov, Murray W.; and Cantor, Abraham, 4,093,744, Cl. 424-333.000.

Westdale, Virgil W.; and Novotny, John, to Addressograph-Multigraph Corporation. Treated carrier particles used in electrophotographic process. 4,093,459, Cl. 96-1.0SD.

Western Stamping Corporation: *See*—
Thomson, James E., 4,093,848, Cl. 235-1.00E.

Westinghouse Electric Corp.: *See*—
Bohinc, Richard J.; Tragesser, Charles W.; Vaill, Ronald E.; and Racki, Francis R., 4,093,837, Cl. 200-150.00G.
Hoffmann, Arthur H.; Gorden, Dale I.; and Kilgore, Lee A., 4,093,869, Cl. 290-31.000.
Long, William H., III, 4,093,948, Cl. 343-7.00A.
Sampson, Ronald N.; and Sanjana, Zal N., 4,093,268, Cl. 280-610.000.
Wilson, John T., 4,093,977, Cl. 361-44.000.

Westland Aircraft Limited: *See*—
Watson, Kenneth; and Saunders, James Edwin, 4,093,049, Cl. 192-47.000.

Wetterau Incorporated: *See*—
Lucas, Lester Wade; and Albers, William Marion, 4,093,086, Cl. 214-16.40A.

Weygant, Nelson E.: *See*—
Beaton, Arthur L.; and Weygant, Nelson E., 4,092,962, Cl. 123-133.000.

Wheeler, Kenneth A. Florescent light fixture. 4,093,974, Cl. 362-216.000.

Wheeler, Robert A.: *See*—
Lynch, Charles R.; and Wheeler, Robert A., 4,092,847, Cl. 73-36.000.

Whelpton, Hugh G.; and Trembley, William H. Fastener installation method. 4,093,491, Cl. 156-309.000.

Whitcomb, Eugene C.: *See*—
Heinz, David M.; and Whitcomb, Eugene C., 4,093,781, Cl. 428-539.000.

White, James F.: *See*—
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,093,635, Cl. 260-346.750.

White, John R., to Goodyear Tire & Rubber Company, The. Method of making a storage stable isocyanate and its use. 4,093,572, Cl. 260-2.5AH.

White, Matthew B., to United States of America, Navy. Optical systems utilizing three-wave heterodyne detectors. 4,093,380, Cl. 356-5.000.

White, William Frederick: *See*—
Horr, Andrew Frederick; and White, William Frederick, 4,093,378, Cl. 355-76.000.

Whited, Charles A.: *See*—
Hauser, Oscar G.; Mannik, Kallis H.; and Whited, Charles A., 4,093,457, Cl. 96-1.200.

Whiteman, Donald R., to RPC Corporation. Spreader for lifting containers. 4,093,090, Cl. 214-620.000.

Whitmore, Floyd Evans, to Whitmore Tool & Die Co., Inc. Water closet flange wrench and puller. 4,092,882, Cl. 81-90.00C.

Whitmore Tool & Die Co., Inc.: *See*—
Whitmore, Floyd Evans, 4,092,882, Cl. 81-90.00C.

Whitney, Ralph H.: *See*—
Smalley, Ned J.; and Whitney, Ralph H., 4,093,094, Cl. 215-276.000.

Wibrow, Gunter, to ITW-Ateco G.m.b.H. Connection and fastening element for connecting workpieces of soft material, especially dowels for pressboards or parts of wood. 4,093,389, Cl. 403-280.000.
Wich, Horst W. Key duplicating machine. 4,092,806, Cl. 51-100.00R.
Wickenberg, Ralph F.; Miller, Donald F.; and Anderson, Lyle R., to Minnesota Mining and Manufacturing Company. Wire retainer. 4,093,334, Cl. 339-107.000.
Widigs, Sven Holger, to Brandstrom, Lars Gosta; and Brandstrom, Karl Peter. Chuck key holder. 4,093,396, Cl. 408-241.00R.
Wie, Chwang Tek: *See—*
Sass, Robert N.; and Wie, Chwang Tek, 4,093,710, Cl. 424-44.000.
Wieschel, John E., to Harnischfeger Corporation. Hydraulic brake system for crane hoist drum. 4,093,184, Cl. 254-139.100.
Wiezer, Hartmut: *See—*
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Wikstrand, Nils, to Moon, Firma. Ski pole. 4,093,250, Cl. 280-11.37Z.
Wild, Edward B.: *See—*
Henricks, John A.; and Wild, Robert E., 4,093,523, Cl. 204-55.00R.
Wild, Robert E.: *See—*
Henricks, John A.; and Wild, Robert E., 4,093,523, Cl. 204-55.00R.
Wildenhain, Barbara: *See—*
Ruckert, Hans; and Wildenhain, Barbara, 4,093,464, Cl. 96-91.00D.
Wildhaber, Ernst. Flexible-disk couplings. 4,092,836, Cl. 64-13.000.
Wilfert, Karl; and Schmid, Walter, to Daimler-Benz Aktiengesellschaft. Passenger motor vehicle. 4,093,255, Cl. 280-788.000.
Wilke, William F.; Hutcheson, Alan G.; and Ross, Richard D. Electronic game apparatus and method. 4,093,223, Cl. 273-94.00R.
Wilkie, Ronald N.; and Mooradian, Arman. Automatic slide stainer. 4,092,952, Cl. 118-58.000.
William H. Rorer, Inc.: *See—*
Diamond, Julius, 4,093,737, Cl. 424-304.000.
Williams, Bernard L.: *See—*
Ziets, George A.; and Williams, Bernard L., 4,093,490, Cl. 156-245.000.
Williams, Patrick Robert, to Temtool Pty., Ltd. Apparatus for sharpening microtome blades. 4,092,805, Cl. 51-85.0BS.
Williams, Raymond Charles: *See—*
Gaudette, Charles Henry; and Williams, Raymond Charles, 4,093,987, Cl. 364-200.000.
Williams, Thomas Alan: *See—*
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Williamson, John Decatur. Speech analyzer for analyzing pitch or frequency perturbations in individual speech pattern to determine the emotional state of the person. 4,093,821, Cl. 179-1.0SC.
Wilner, Leslie B., to Becton, Dickinson Electronics Company. Sculptured pressure diaphragm. 4,093,933, Cl. 338-42.000.
Wilson, Eddie A.: *See—*
Morris, Donald A.; Wilson, Eddie A.; and Little, Eric A., 4,092,804, Cl. 47-66.000.
Wilson, Harold L. Aerator sewage tank. 4,093,549, Cl. 210-195.00S.
Wilson, John T., to Westinghouse Electric Corp. Ground fault protective device. 4,093,977, Cl. 361-44.000.
Wilson, Kenneth J., to Wilson Tool Company. Self-stripping punch and guide assembly. 4,092,888, Cl. 83-140.000.
Wilson, Phillip Steven: *See—*
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Wilson Tool Company: *See—*
Wilson, Kenneth J., 4,092,888, Cl. 83-140.000.
Winchell, David A., to Baxter Travenol Laboratories, Inc. Attachable hanger for containers. 4,093,169, Cl. 248-311.300.
Winchell, David A.: *See—*
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Winderl, Siegfried: *See—*
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Wing Industries Inc.: *See—*
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Winicov, Murray W.; and Cantor, Abraham, to West Laboratories, Inc. Killing bacterial spores with glutaraldehyde sporicidal compositions. 4,093,744, Cl. 424-333.000.
Winn, Martin; and Kyncl, Jaroslav, to Abbott Laboratories. N-(2-benzimidazolyl)-piperazines. 4,093,726, Cl. 424-250.000.
Wirz, Carl A. Control device for an electronic watch. 4,092,821, Cl. 58-23.0BA.
Witherspoon, John F., to United States of America, Navy. Shock-excursion apparatus for retracting the umbilical plug of a missile. 4,092,898, Cl. 89-1.811.
Withop, Arthur; and Travagli, Roger Emil, to Memorex Corporation. Method of making manganese-zinc ferrite. 4,093,688, Cl. 264-65.000.
Withycombe, Donald Arthur; Mookherjee, Braja Dulal; Vock, Manfred Hugo; and Vinals, Joaquin Francisco, to International Flavors & Fragrances Inc. Flavoring with 2,4,6-triisobutyl-1,3,5-trioxane. 4,093,752, Cl. 426-536.000.
Wize, Gary A., to General Motors Corporation. Seat belt securing device. 4,093,275, Cl. 280-747.000.
Woditsch, Peter: *See—*
Heine, Heinrich; Woditsch, Peter; Bohmann, Theodor; and Rade, Dieter, 4,093,777, Cl. 428-403.000.
Wojciak, Stanley, to Loctite Corporation. Process for microencapsulation of metallocenes. 4,093,556, Cl. 252-316.000.
Wolff Walsrode Aktiengesellschaft: *See—*
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Wong, Ted Lee: *See—*
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Wood, Donald C.; and McLaughlin, Robert L., to DeSoto, Inc. Method for producing a prilled urea bath bead composition. 4,093,745, Cl. 424-358.000.
Wood, Robert A. R., to Teleflex Incorporated. Axial piston pump. 4,092,905, Cl. 91-499.000.
Woster, George William, Jr.: *See—*
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Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 3-[(4-Chromanylidene)amino]-2-oxazolidinones. 4,093,627, Cl. 260-307.00C.
Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. N-arylidene-4-chromanamines. 4,093,799, Cl. 542-422.000.
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Wszolek, Walter Robert, to W. R. Grace & Co. Plastisol composition and container closure gasket made therefrom. 4,093,097, Cl. 215-349.000.
Wszolek, Walter Robert, to W. R. Grace & Co. Plastisol composition and container closure gasket made therefrom. 4,093,098, Cl. 215-349.000.
Wu, Che-Kuang: *See—*
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Wu, Samuel Chinlun; and Holick, Stephen Alan, to Adolph Coors Company. Seamer apparatus. 4,092,940, Cl. 113-29.000.
Wulf, Helmut; and Niemann, Klaus, to Daimler-Benz Aktiengesellschaft. Positive guide mechanism for road vehicles with non-turnable wheels. 4,092,931, Cl. 104-247.000.
Wunder, Friedrich: *See—*
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Wynkoop, Raymond; Norman, Oscar L.; and Norton, Richard V., to Suntech, Inc. Terephthalic acid process. 4,093,528, Cl. 204-180.00P.
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Eichorn, Roger H., deceased; Lincoln First Bank of Rochester, executor; and Silverberg, Morton, 4,093,367, Cl. 355-3.00R.
Fisli, Tibor, 4,093,350, Cl. 350-299.000.
Guenther, Joachim, 4,093,372, Cl. 355-50.000.
Hauser, Oscar G.; Mannik, Kallis H.; and Whited, Charles A., 4,093,457, Cl. 96-1.200.
Hewitt, Robert E., 4,093,369, Cl. 355-15.000.
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Sohl, Gordon, 4,093,059, Cl. 400-144.200.
Zucker, Edwin; Shogren, David K.; and Redden, David N., 4,093,374, Cl. 355-57.000.
Yabuki, Kazuyasu: *See—*
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Yabutani, Kunihiro; Ikeda, Kenichi; Hatta, Shigenori; and Harada, Tatsuo, to Nihon Nohyaku Co., Ltd. Novel benzoic anilide derivative and fungicide containing same. 4,093,743, Cl. 424-324.000.
Yagupolsky, Lev Moiseevich: *See—*
Belous, Viktor Mikhailovich; Yagupolsky, Lev Moiseevich; Alexeeva, Ljubov Antonovna; Sokolov, Sergei Vasilievich; and Ponomarev, Alexei Ivanovich, 4,093,665, Cl. 260-612.00D.
Yamada, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetion system for preventing engine misfires during gear changes. 4,092,961, Cl. 123-119.0EC.
Yamaguchi, Takashi: *See—*
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Yamaguchi, Yoshichika. Positive cam type compressor. 4,093,408, Cl. 418-92.000.
Yamakoshi, Yasumichi: *See—*
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Yamamoto, Yujiro. Piezoelectric multimorph switches. 4,093,883, Cl. 310-317.000.
Yamasaki, Harumasa: *See—*
Aoki, Shuzo; and Yamasaki, Harumasa, 4,093,776, Cl. 428-402.000.
Yamashita, Shigeru; Masaki, Kazuo; and Shibahara, Masashi, to Nihon Hammond Kabushiki Kaisha. Electronic echo generation equipment. 4,093,820, Cl. 179-1.00J.
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Yara Engineering Corporation: *See—*
Moll, William F., Jr.; and Botta, Frank J., 4,093,564, Cl. 252-518.000.
Yasukuni, Mitsuo, to Minolta. Lens system with frontal aperture stop. 4,093,348, Cl. 350-206.000.

Yavne, Raphael O.: *See*—
Bardash, Manuel L.; Clasen, Carl P.; Scudder, Robert M.; Simon, Lawrence H.; Sorkin, Charles S.; Yavne, Raphael O.; Ekis, Robert W.; and Mintzer, Alfred I., 4,093,153, Cl. 244-3.140.

Yeda Research and Development Co., Ltd.: *See*—
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Zitone, Joseph. Auxiliary rider support for jog carts. 4,093,306, Cl. 297-217.000.

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Zwahlen, Gunther; Umsonst, Gerhard; and Laely, Andreas, to Ciba-Geigy Corporation. Process for the mass coloration or whitening of linear polyesters. 4,093,584, Cl. 260-40.00P.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF JUNE, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Caterpillar Tractor Co.: *See*—
Mitchell, Thomas L., T971,002, Cl. 184-6.140.

Collier, William Wilkinson, to International Business Machines Corporation. Method for synchronizing sets of interacting processes. T971,005, 6-6-78, Cl. 364-300.000.

Dunn, Colin Malcolm Roy, to Imperial Chemical Industries Limited. Foam plastics. T971,004, 6-6-78, Cl. 264-53.000.

Du Pont de Nemours, E. I., and Company: *See*—
Hecht, James L., T971,007, Cl. 426-234.000.
Orphanides, Gus George, T971,003, Cl. 260-326.260.

Hansen, David R., to Shell Oil Company. Foxing primer. T971,008, 6-6-78, Cl. 428-266.000.

Hecht, James L., to Du Pont de Nemours, E. I., and Company. Microwave treatment of package foods. T971,007, 6-6-78, Cl. 426-234.000.

Imperial Chemical Industries Limited: *See*—
Dunn, Colin Malcolm Roy, T971,004, Cl. 264-53.000.

International Business Machines Corporation: *See*—
Collier, William Wilkinson, T971,005, Cl. 364-300.000.

Mangialardi, Gino J., Jr., to United States of America, Agriculture. Lint-cotton reclaiming apparatus for cotton gins. T971,001, 6-6-78, Cl. 19-202.000.

Mitchell, Thomas L., to Caterpillar Tractor Co. Adjustable nozzle. T971,002, 6-6-78, Cl. 184-6.140.

Orphanides, Gus George, to Du Pont de Nemours, E. I., and Company. Synthesis of dimaleimides. T971,003, 6-6-78, Cl. 260-326.260.

Shell Oil Company: *See*—
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Smith, Anthony J., to Tennessee Valley Authority. Purification of phosphoric acid solutions. T971,006, 6-6-78, Cl. 423-321.00R.

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Smith, Anthony J., T971,006, Cl. 423-321.00R.
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LIST OF REISSUE PATENTEES

TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See*—
Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, Re. 29,656, Cl. 128-272.300.

Armstrong, William E., to Motorola, Inc. Process and product for making a single supply N-channel silicon gate device. Re. 29,660, Cl. 148-1.500.

Bildner, Heinz Helmut. Radial ski having a profiled running surface. Re. 29,659, Cl. 280-608.000.

Bryant, Peter Lorin: *See*—
Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, Re. 29,656, Cl. 128-272.300.

Chevron Research Company: *See*—
Hendrickson, Yngve Gust; and King, John M., Re. 29,661, Cl. 252-42.700.

Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, to Abbott Laboratories. Additive transfer unit having a slidable piercing member. Re. 29,656, Cl. 128-272.300.

Classen, Charles Carlock: *See*—
Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, Re. 29,656, Cl. 128-272.300.

Hendrickson, Yngve Gust; and King, John M., to Chevron Research Company. Sulfurized metal phenates. Re. 29,661, Cl. 252-42.700.

Husted, Royce H., to Saroy Engineering. Power driven ski. Re. 29,657, Cl. 180-5.00R.

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Minnesota Mining and Manufacturing Company: *See*—
Theissen, Donald R., Re. 29,663, Cl. 428-336.000.

Motorola, Inc.: *See*—
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RCA Corporation: *See*—
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Rous, Benjamin, to Stone Container Corporation. Book carton with improved opener. Re. 29,658, Cl. 206-424.000.

Saroy Engineering: *See*—
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Stone Container Corporation: *See*—
Rous, Benjamin, Re. 29,658, Cl. 206-424.000.

Theissen, Donald R., to Minnesota Mining and Manufacturing Company. Moisture-resistant solar control film. Re. 29,663, Cl. 428-336.000.

Yocom, Perry Niel, to RCA Corporation. Rare earth activated lanthanum and lutetium oxy-chalcogenide phosphors. Re. 29,662, Cl. 252-301.40S.

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Ryan, John J. Impatiens plant Maya. 4,258, 6-6-78, Cl. 68.000.

Ryan, John J. Impatiens plant — Navajo. 4,259, 6-6-78, Cl. 68.000.

Ryan, John J. Impatiens plant — Chickasaw. 4,260, 6-6-78, Cl. 68.000.

Ryan, John J. Impatiens plant — Creek. 4,261, 6-6-78, Cl. 68.000.

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Ampex Corporation: *See—*
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Anderson, Victor F., to Shell Oil Company. Shoe. 248,062, 6-6-78, Cl. D2-291.000.

Anderson, Victor F., to Shell Oil Company. Shoe. 248,063, 6-6-78, Cl. D2-293.000.

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UMC Industries, Inc.: *See—*
Moore, Walter E.; and Grethey, Albert K., 248,121, Cl. D52-3.00R.

Venable, Floyd James, Jr. Wrench. 248,082, 6-6-78, Cl. D8-29.000.

Vermillion, Don W.: *See—*
Clowers, Earl R.; Davis, John C.; Pearman, Fred E., Jr.; and Vermillion, Don W., 248,104, Cl. D15-53.000.

Warnekros, Casper P. Sorting tray. 248,078, 6-6-78, Cl. D7-37.000.

Wilson, George A., to Ampex Corporation. Tape transport. 248,099, 6-6-78, Cl. D14-41.000.

Wright, John R., to American Optical Corporation. Holder for opthalmic instrument control panel. 248,110, 6-6-78, Cl. D24-31.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Shuzuki, Toshiyuki; and Suzuki, Tadao, 248,095, Cl. D12-205.000.

Zagara, Frank A.; and Nelson, John M., to Bernzomatic Corporation. Portable torch. 248,083, 6-6-78, Cl. D8-30.000.

Zamkovec, John; and Lavallee, Nancy. Set of chessmen or similar article. 248,116, 6-6-78, Cl. D34-5.0CH.

CLASSIFICATION OF PATENTS

ISSUED JUNE 6, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3

1	4,092,739
1.7	4,092,742
1.911	4,092,740
1.913	4,092,741
13	4,092,743

CLASS 4

7	4,092,744
172.17	4,092,746
286	4,092,747
288	4,092,745

CLASS 5

85	4,092,748
267	4,092,749
343	4,092,750
345 R	4,092,751
	4,092,752

CLASS 7

158	4,092,753

CLASS 8

2.5 A	4,093,415
	4,093,416
137	4,093,417
142	4,093,418

CLASS 9

1.1	4,092,754
1.2	4,092,755
8 R	4,092,756

CLASS 12

127	4,092,757

CLASS 13

2 R	4,093,816

CLASS 15

180	4,092,758
257	4,092,759

CLASS 16

35 R	4,092,760

CLASS 17

1 E	4,092,761
45	4,092,762

CLASS 19

98	4,092,763
107	4,092,764

CLASS 21

102 R	4,093,419

CLASS 23

230 EP	4,093,420
259.5	4,093,421
284	4,093,422
288 FC	4,093,423

CLASS 24

16 PB	4,092,765
73 MF	4,092,766
230 AL	4,092,767

CLASS 29

156.8 R	4,092,768
234	4,092,769
263	4,092,770
401 F	4,092,771
434	4,092,772
512	4,092,773

CLASS 30

92	4,092,774
95	4,092,775
253	4,092,776
273	4,092,777

CLASS 32

60	4,092,778

CLASS 33

1 SD	4,092,779
139	4,092,780
143 J	4,092,781
174 N	4,092,782
180 R	4,092,783

CLASS 34

13	4,092,784

CLASS 35

1	4,092,785
8 R	4,092,786
17	4,092,788
29 R	4,092,787

CLASS 37

12	4,092,789
71	4,092,790

CLASS 40

36	4,092,791
677	4,092,792

CLASS 42

1 LP	4,092,794
1 ST	4,092,793

CLASS 43

17	4,092,795
44.83	4,092,796
102	4,092,797

CLASS 44

3 C	4,093,424
10 F	4,093,425

CLASS 46

11	4,092,798
32	4,092,799

CLASS 47

1.3	4,092,800
16	4,092,802
41.12	4,092,801
62	4,092,803
66	4,092,804

CLASS 51

85 BS	4,092,805
100 R	4,092,806
168	4,092,807

CLASS 52

11	4,092,808
63	4,092,809
81	4,092,810
224	4,092,811
309.3	4,092,812
397	4,092,813
730	4,092,814

CLASS 53

3	4,092,815
234	4,092,816
298	4,092,817

CLASS 55

8	4,093,426
17	4,093,427
52	4,093,428
58	4,093,429
107	4,093,430
112	4,093,431
138	4,093,432
226	4,093,433
	4,093,434
269	4,093,435
	4,093,436
487	4,093,437

CLASS 56

341	4,092,818

CLASS 58

23 BA	4,092,821
23 R	4,092,819
	4,092,820
	4,092,822
125 C	4,092,823

CLASS 60

39.02	4,092,824
	4,092,825
39.74 R	4,092,826
398	4,092,827
506	4,092,828
517	4,092,829
671	4,092,830

CLASS 61

45 D	4,092,831
51	4,092,832

CLASS 62

6	4,092,833
123	4,092,834
136	4,092,835

CLASS 64

13	4,092,836
27 NM	4,092,837

CLASS 65

62	4,093,438
65	4,093,439

CLASS 66

214	4,092,838

CLASS 68

19	4,092,839

CLASS 71

65	4,093,440
78	4,093,441
90	4,093,442
	4,093,443
92	4,093,444
100	4,093,445
109	4,093,446
111	4,093,447

CLASS 72

275	4,092,875
312	4,092,840
320	4,092,841
379	4,092,842

CLASS 73

17 R	4,092,843
23	4,092,844
28	4,092,845
29	4,092,846
36	4,092,847
86	4,092,848
101	4,092,849
113	4,092,850
114	4,092,851
117.3	4,092,852
121	4,092,853
133 R	4,092,854
134	4,092,855
141 A	4,092,856
144	4,092,857
170 A	4,092,858
194 B	4,092,859
304 R	4,092,860
311	4,092,861
362 AR	4,092,863
362 CP	4,092,862
363	4,092,864
431	4,092,866
609	4,092,867
638	4,092,868
665	4,092,869
756	4,092,865

CLASS 74

7 R	4,092,870
40	4,092,871
41	4,092,872
82	4,092,873
100 R	4,092,874
478	4,092,876
625	4,092,877
801	4,092,878

CLASS 75

0.5 AA	4,093,450
0.5 R	4,093,449
3	4,093,448
43	4,093,451
53	4,093,452
129	4,093,453
236	4,093,454
256	4,093,455

CLASS 81

6	4,092,879
9.5 A	4,092,880
57.34	4,092,881
90 C	4,092,882

CLASS 82

3	4,092,883
5	4,092,884
33 R	4,092,885

CLASS 83

56	4,092,886
	4,092,887
140	4,092,888
177	4,092,889
284	4,092,890
341	4,092,891
413	4,092,892

CLASS 84

1.11	4,092,893
319	4,092,894
345	4,092,895

CLASS 85

50 R	4,092,896

CLASS 87

29	4,092,897

CLASS 89

1.811	4,092,898
1.816	4,092,899
33 B	4,092,900
46	4,092,901

CLASS 90

11 D	4,092,902

CLASS 91

36	4,092,903
395	4,092,904
499	4,092,905

CLASS 93

49 R	4,092,906

CLASS 96

1 PE	4,093,456
1 SD	4,093,459
1.2	4,093,457
27 E	4,093,460
36	4,093,461
66 HD	4,093,462
67	4,093,463
87 R	4,093,458
91 D	4,093,464
115 R	4,093,465

CLASS 98

40 A	4,092,907
60	4,092,908

CLASS 99

444	4,092,909
472	4,092,910
483	4,092,911

CLASS 100

3	4,092,912
24	4,092,913
88	4,092,914
93 P	4,092,915
174	4,092,916
176	4,092,917

CLASS 101

53	4,092,919
77	4,092,920
93.21	4,092,921
288	4,092,918
363	4,092,922
415.1	4,092,923
426	4,092,924
467	4,092,925

CLASS 102

204 R	4,092,926
229	4,092,927

CLASS 104

119	4,092,928
173 R	4,092,929
247	4,092,930
	4,092,931

CLASS 105

207	4,092,932
366 R	4,092,933

CLASS 106

1.22	4,093,466
38.35	4,093,467
39.7	4,093,468
53	4,093,469
56	4,093,470
99	4,093,471

CLASS 109

24.1	4,092,934

CLASS 110

186	4,092,935

CLASS 111

1	4,092,936

CLASS 112

121.11	4,092,937
158 E	4,092,938
254	4,092,939

CLASS 113

29	4,092,940

CLASS 114

218	4,092,941
222	4,092,942
	4,092,943
297	4,092,944

CLASS 115

2	4,092,945
18 E	4,092,946

CLASS 116

114 PV	4,092,948
118 R	4,092,947

CLASS 118

6	4,092,949
8	4,092,950
50	4,092,951
58	4,092,952
642	4,092,953
658	4,092,954

CLASS 123

32 EA	4,092,955
41.74	4,092,956
48 B	4,092,957
73 PP	4,092,958
119 A	4,092,959
	4,092,960
119 EC	4,092,961
133	4,092,962
	4,092,963
139 AT	4,092,964
140 FG	4,092,965
141	4,092,966
148 B	4,092,967
148 E	4,092,968
191 S	4,092,969
198 D	4,092,970

CLASS 125

16 R	4,092,971
	4,092,972

CLASS 126

37 B	4,092,973
38	4,092,974
41 R	4,092,975
63	4,092,976
270	4,092,977
	4,092,978
271	4,092,979

CLASS 128

2 A	4,092,980
2.1 B	4,092,981
82.1	4,092,982
214 R	4,092,983
229	4,092,984
272.3	Re.29,656
303.13	4,092,985
303.14	4,092,986

CLASS 131

8 R	4,092,987
17 R	4,092,988
	4,092,989

CLASS 133

1 R	4,092,990

CLASS 134

104	4,093,472
127	4,092,991

CLASS 135

3 R	4,092,992

CLASS 136

89 P	4,093,473

CLASS 137

15	4,092,993
65	4,092,994
119	4,092,995
344	4,092,996
351	4,092,997
471	4,092,998
495	4,093,001
504	4,092,999
554	4,093,000
596.2	4,093,002
615	4,093,003

CLASS 138

140	4,093,004

CLASS 140

123.6	4,093,005

CLASS 144

288 A	4,093,006
326 R	4,093,007

CLASS 145

61 EA	4,093,008

CLASS 148

1.5	Re.29,660
2	4,093,474
32	4,093,475
32.5	4,093,476
108	4,093,477

CLASS 149

2	4,093,478

CLASS 150

5	4,093,009
52 J	4,093,010

CLASS 151

57	4,093,011

CLASS 152

226	4,093,012
240	4,093,013
362 CS	4,093,014

CLASS 156

54	4,093,480
95	4,093,481
210	4,093,482
227	4,093,483
244.13	4,093,484
	4,093,485
244.16	4,093,487
244.19	4,093,486
245	4,093,488
	4,093,489
	4,093,490
309	4,093,491
331	4,093,492
358	4,093,493
394	4,093,495
449	4,093,496
473	4,093,497
494	4,093,498
498	4,093,499
510	4,093,500
577	4,093,494
580	4,093,501
624	4,093,502
628	4,093,503
656	4,093,504

CLASS 157

1.1	4,093,015

CLASS 159

6 W	4,093,479
9 A	4,093,505

CLASS 162

17	4,093,506
18	4,093,507
30 K	4,093,508
124	4,093,016
158	4,093,509

175 4,093,510
234 4,093,511
348 4,093,512

CLASS 164

28 4,093,017
32 4,093,018
52 4,093,019

CLASS 165

1 4,093,020
4,093,021
39 4,093,022
89 4,093,023
170 4,093,024

CLASS 166

251 4,093,025
256 4,093,026
272 4,093,027
281 4,093,028
305 R 4,093,029
315 4,093,030

CLASS 172

372 4,093,031

CLASS 174

32 4,093,817
48 4,093,818

CLASS 176

37 4,093,513
65 4,093,514

CLASS 177

165 4,093,032

CLASS 178

2 R 4,093,819

CLASS 179

1 J 4,093,820
1 SC 4,093,821
1 VL 4,093,822
15 AT 4,093,827
15 BA 4,093,823
15 BS 4,093,825
15 BT 4,093,824
16 EC 4,093,826
18 FC 4,093,828
81 R 4,093,829
99 4,093,830
100.1 VC 4,093,831
100.4 D 4,093,832
100.41 D 4,093,833

CLASS 180

5 R Re.29,657
4,093,033
53 R 4,093,034
65 DD 4,093,035
70 R 4,093,036
77 R 4,093,037
82 R 4,093,038

CLASS 181

229 4,093,039
252 4,093,040

CLASS 186

1 D 4,093,041

CLASS 188

67 4,093,042
73.3 4,093,044
73.5 4,093,045
73.6 4,093,043
273 4,093,046

CLASS 191

12 R 4,093,047

CLASS 192

0.049 4,093,050
13 R 4,093,048
47 4,093,049
87.13 4,093,051
88 B 4,093,052
98 4,093,053
106.1 4,093,054
116.5 4,093,055
127 4,093,056

CLASS 194

1 R 4,093,057
71 4,093,058

CLASS 195

1.8 4,093,515
27 4,093,516
66 R 4,093,517
142 4,093,518

CLASS 198

380 4,093,062
425 4,093,063
485 4,093,064
735 4,093,065
861 4,093,066

CLASS 200

50 A 4,093,834
61.45 M 4,093,835
61.53 4,093,836
150 G 4,093,837
303 4,093,838

CLASS 202

241 4,093,519

CLASS 204

15 4,093,520
43 R 4,093,521
51 4,093,522
55 R 4,093,523
61 4,093,524
98 4,093,525
104 4,093,526
129 4,093,527
180 P 4,093,528
197 4,093,529
224 M 4,093,530
265 4,093,531
271 4,093,532
296 4,093,533

CLASS 206

219 4,093,067
424 Re.29,658
443 4,093,068
455 4,093,069
507 4,093,070
4,093,071
521 4,093,072
606 4,093,073
629 4,093,074

CLASS 208

120 4,093,535
121 4,093,536
164 4,093,537

CLASS 209

73 4,093,075
172.5 4,093,538

CLASS 210

17 4,093,539
23 F 4,093,540
40 4,093,541
54 4,093,542
59 4,093,543
4,093,544
86 4,093,545
150 4,093,546
169 4,093,547
180 4,093,548
195 S 4,093,549
198 C 4,093,550
201 4,093,551
297 4,093,552

CLASS 211

74 4,093,076
189 4,093,078
194 4,093,077

CLASS 213

62 A 4,093,079
75 R 4,093,080

CLASS 214

1 BB 4,093,081
1 PA 4,093,082
7 4,093,083
11 R 4,093,084
16 R 4,093,085
16.4 A 4,093,086
83.26 4,093,087
451 4,093,088
516 4,093,089
620 4,093,090
673 4,093,091
674 4,093,092

CLASS 215

251 4,093,093
276 4,093,094
307 4,093,095
330 4,093,096
349 4,093,097
4,093,098

CLASS 217

72 4,093,099

CLASS 218

138 4,093,897

CLASS 219

8.5 4,093,839
10.55 E 4,093,841
10.55 F 4,093,840
121 EB 4,093,843
121 LM 4,093,842
124.02 4,093,844
132 4,093,845
286 4,093,846
501 4,093,847

CLASS 220

3 4,093,100
22 4,093,101
46.2 4,093,114
67 4,093,102
283 4,093,103
316 4,093,104
373 4,093,105

CLASS 221

224 4,093,106

CLASS 222

23 4,093,107
401 4,093,108
527 4,093,109

CLASS 227

9 4,093,110
26 4,093,111
150 4,093,112

CLASS 228

36 4,093,113

CLASS 229

17 G 4,093,115
40 4,093,116
70 4,093,117

CLASS 233

26 4,093,118

CLASS 235

1 E 4,093,848
92 PC 4,093,849
92 TF 4,093,850
302.2 4,093,851

CLASS 237

12.3 A 4,093,119

CLASS 238

8 4,093,120

CLASS 239

117 4,093,121
127.3 4,093,122
322 4,093,123
327 4,093,124
553.3 4,093,125

CLASS 241

37.5 4,093,126
55 4,093,127
82.5 4,093,128
186 R 4,093,129
245 4,093,130

CLASS 242

6 4,093,131
7.03 4,093,132
18 PW 4,093,133
4,093,134
4,093,135
45 4,093,136
46.4 4,093,137
55.2 4,093,138
4,093,139
56.2 4,093,140
56.9 4,093,141
71.1 4,093,142
75.51 4,093,143
84.52 A 4,093,144
107.4 A 4,093,145
158.2 4,093,146
159 4,093,147
182 4,093,148
192 4,093,150
198 4,093,149
4,093,151

CLASS 244

3.14 4,093,153
3.16 4,093,154
12.4 4,093,155
45 A 4,093,156
53 R 4,093,157
182 4,093,158
187 4,093,159
199 4,093,160

CLASS 246

5 4,093,161
182 B 4,093,162
476 4,093,163

CLASS 248

20 4,093,164
106 4,093,165
126 4,093,166
188 4,093,167
220.4 4,093,168
311.3 4,093,169
359 4,093,170
515 4,093,171

CLASS 249

19 4,093,172
105 4,093,173
120 4,093,174
153 4,093,175
167 4,093,176

CLASS 250

213 A 4,093,852
231 SE 4,093,853
269 4,093,854
282 4,093,855
293 4,093,856
369 4,093,857
424 4,093,858
445 T 4,093,859
4,093,860
4,093,861
4,093,862
4,093,863
505 4,093,864
563 4,093,866
566 4,093,865
576 4,093,867

CLASS 251

54 4,093,177
104 4,093,178
133 4,093,179
248 4,093,180

CLASS 252

42.7 Re.29,661
70 4,093,553
78.3 4,093,554
188.3 R 4,093,555
301.4 S Re.29,662
316 4,093,556
389 R 4,093,557
432 4,093,558
443 4,093,559
455 Z 4,093,560
466 J 4,093,561
511 4,093,562
513 4,093,563
518 4,093,564
522 4,093,565
527 4,093,566

CLASS 254

97 4,093,181
126 4,093,182
134.3 PA 4,093,183
139.1 4,093,184
154 4,093,185
156 4,093,186

CLASS 256

49 4,093,187

CLASS 259

7 4,093,189

CLASS 260

2.2 R 4,093,568
2.5 AH 4,093,572
2.5 AM 4,093,569
2.5 B 4,093,570
4,093,571
2.5 BE 4,093,573
8 4,093,574
15 4,093,575
17 R 4,093,576
21 E 4,093,567
22 CB 4,093,577
28 P 4,093,578
29.4 R 4,093,579
29.6 MH 4,093,581
29.6 SQ 4,093,580
30.6 R 4,093,582
33.6 AQ 4,093,583
40 P 4,093,584
4,093,585
45.75 B 4,093,589
45.8 N 4,093,586
45.8 NE 4,093,587
45.8 R 4,093,588
45.85 B 4,093,592
45.85 H 4,093,591
45.85 P 4,093,593
45.85 S 4,093,590
47 C 4,093,595
47 EP 4,093,594
47 ET 4,093,596
4,093,597
4,093,598
47 R 4,093,599
49 4,093,600
63 UY 4,093,601
73 R 4,093,602
75 R 4,093,603
77.5 CH 4,093,604
78 SC 4,093,605
112 B 4,093,606
4,093,607
4,093,608
112.5 LH 4,093,611
112.5 R 4,093,610
112.5 S 4,093,609
122 4,093,612
154 4,093,613
239 BC 4,093,615
284 4,093,619
291 4,093,620
294.8 H 4,093,621
295 R 4,093,622
299 4,093,614
4,093,623
302 D 4,093,624
306.7 C 4,093,625
307 C 4,093,627
307 FA 4,093,626
326.12 R 4,093,628
326.34 4,093,629
326.85 4,093,630
345.2 4,093,631
345.5 4,093,632
346.11 4,093,633
346.74 4,093,634
346.75 4,093,635
348.29 4,093,636
405 4,093,637
408 4,093,638
429.9 4,093,639
4,093,640
448.2 E 4,093,641
449 M 4,093,643
465 F 4,093,644
505 C 4,093,645
508 4,093,646
515 R 4,093,647
519 4,093,648
530 N 4,093,649
539 A 4,093,650
543 H 4,093,651
544 C 4,093,652
558 A 4,093,653
561 A 4,093,654
564 RF 4,093,655
566 B 4,093,656
567.6 M 4,093,657
570 D 4,093,658
586 R 4,093,659
591 4,093,660
595 4,093,661
606.5 P 4,093,662
607 B 4,093,663
610 D 4,093,664
612 D 4,093,665
615 A 4,093,666
651 F 4,093,669
653.1 R 4,093,670
668 R 4,093,671
674 R 4,093,672
824 EP 4,093,673
830 P 4,093,674
835 4,093,675
857 PG 4,093,676
858 4,093,677
897 A 4,093,678
927 R 4,093,679
966 4,093,680

CLASS 261

122 4,093,681

CLASS 264

0.5 4,093,682
25 4,093,683
4,093,684
28 4,093,685
45.5 4,093,686
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139 4,093,814
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855 4,093,668

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D1—	24	248,061		169	248,072		30	248,083		190	248,094	D16—	65	248,105		5 K	248,114
D2—	291	248,062		177	248,073		61	248,084		205	248,095	D19—	26	248,106		5 SS	248,113
	293	248,063		293	248,074		64	248,085	D13—	24	248,096	D23—	55	248,107		15 AJ	248,119
	301	248,064	D7—	11	248,075		98	248,086			248,097		128	248,108		15 R	248,118
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	400	248,066		23	248,077	D9—	149	248,088		41	248,099		31	248,110	D52—	3 R	248,121
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DESIGN PATENTS

1 :	248,067		248,117		248,119	27 :	248,084		248,083		248,108
4 :	248,076		248,122	18 :	248,112		248,103		248,085	42 :	248,061
6 :	248,066		248,124	20 :	248,111	29 :	248,121		248,096		248,107
	248,073	12 :	248,114	24 :	248,070	34 :	248,062		248,097	44 :	248,071
	248,078	16 :	248,082		248,087		248,063		248,098	45 :	248,088
	248,089	17 :	248,072	25 :	248,065		248,064		248,110	48 :	248,094
	248,099		248,079		248,086		248,090		248,116		248,102
	248,100		248,093		248,105	36 :	248,069	37 :	248,104		248,106
	248,101		248,113		248,123		248,074	39 :	248,081	51 :	248,109

PLANT PATENTS

6 :	4,258	4,259	4,260	4,261	

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1 :	T971,006										
10 :	T971,003	17 :	T971,002	28 :	T971,001	36 :	T971,005	48 :	T971,008	51 :	T971,007

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